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**AN EVALUATION OF THE IMPLEMENTATION OF TOTAL QUALITY
MANAGEMENT (TQM) WITHIN THE INFORMATION AND
COMMUNICATIONS TECHNOLOGY (ICT) SECTOR IN JORDAN**

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in partial fulfilment of the requirements for
the degree of Doctor of Philosophy

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ABSTRACT

Recognising quality to be a key focus for competitiveness, Total Quality Management (TQM) was established and used in developed countries as a new philosophy for managing organisations. However, TQM in developing countries has received little attention and little research has been conducted into the successful implementation of TQM systems in these countries.

The research described in this thesis assesses the adoption of TQM factors in the Information and Communications Technology (ICT) sector in Jordan and identifies the main impediments to successful adoption. In addition, this research explores the impact of TQM implementation on improving competitiveness and the role of environmental factors (government policy and social culture) in encouraging the implementation and sustainability of TQM in the Jordanian ICT sector.

Both questionnaires and semi-structured interviews were employed to fulfil the study objectives. The questionnaire aimed to investigate the implementation of TQM in the ICT sector, while, semi-structured interviews with General and TQM managers aimed to gain an understanding of themes which had emerged from the questionnaire. In order to fully understand company performance, customers of the ten largest companies in the Jordanian ICT sector were also interviewed.

Analysis of the data identified three potential impediments to the successful implementation of TQM. These impediments being; the internal cultural characteristics of organisations, the level of employee empowerment and the degree of continuous improvement that takes place. The results also indicate the critical impact that successful TQM implementation has on improving company competitiveness. The results also show the success of government reward policy, government policy identifying quality performance levels of organisations and the national education system as the source of qualified staff. These are seen as encouraging and supporting TQM implementation. Conversely, governmental policy towards taxation and new licences, bureaucracy and customer perspective regarding quality which gives a priority to price rather than quality as the discouraging factor. The research findings have enabled the development of a model to support TQM implementation within the Jordanian ICT sector.

The study has made an original contribution to the academic and practical knowledge of quality management. This is an important first exploratory empirical study of TQM implementation in the ICT sector in Jordan. Some recommendations for further research have been derived from this research.

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Table of contents

<u>Contents</u>	<u>page no</u>
ABSTRACT	2
ACKNOWLEDGEMENT	3
Table of contents	4
List of tables	9
List of figures	11
Chapter One	12
Introduction	12
1.1 INTRODUCTION	12
1.2 BACKGROUND AND NEED FOR THE STUDY	12
1.3 RESEARCH AIM AND OBJECTIVES	16
1.4 LAYOUT OF THE STUDY	17
Chapter Two A Brief Look at the Hashemite Kingdom of Jordan	21
2.1 INTRODUCTION	21
2.2 JORDAN: GENERAL OVERVIEW	21
2.2.1 Geography and climate	21
2.2.2 Religion	23
2.2.3 Education	23
2.2.4 Economy	25
2.3 INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) SECTOR	27
2.3.1 The History of the ICT Sector	27
2.3.2 The Importance of the ICT Sector	29
2.3.3 The role of ICT in the Jordanian economy	31
2.3.4 The Telecommunications Regulatory Commission (TRC)	33
2.3.5 The types of services presented by ICT in Jordan	35
2.4 CHAPTER SUMMARY	37
Chapter Three Total Quality Management Fundamental Issues	39
3.1 INTRODUCTION	39

3.2 THE CONCEPT OF TQM.....	39
3.3 EVOLUTION OF TOTAL QUALITY MANAGEMENT	42
3.3.1 <i>Inspection</i>	43
3.3.2 <i>Quality control</i>	43
3.3.3 <i>Quality assurance</i>	44
3.3.4 <i>Total quality management</i>	44
3.4 QUALITY GURUS AND THEIR CONTRIBUTION.....	47
3.5 MODELS OF TQM IMPLEMENTATION	57
3.6. ISO 9000	68
3.7. CRITICISMS OF TOTAL QUALITY MANAGEMENT	71
3.8 CHAPTER SUMMARY	75
Chapter Four The Implementation of Quality Factors and Issues of TQM	76
4.1 INTRODUCTION	76
4.2 IMPLEMENTATION FACTORS	76
4.2.1 <i>Top management commitment</i>	76
4.2.2 <i>Employee empowerment</i>	80
4.2.3 <i>Employee training</i>	82
4.2.4 <i>Organisational Culture</i>	84
4.2.5 <i>Quality measurement and benchmarking</i>	94
4.2.5.1 Statistical process control (SPC).....	95
4.2.5.2 <i>Six Sigma</i>	96
4.2.5.3 <i>Cost of quality</i>	99
4.2.5.4 <i>Self-assessment</i>	101
4.2.5.5 <i>Benchmarking</i>	102
4.2.6 <i>Continuous improvement</i>	106
4.2.7 <i>Suppliers relationship</i>	109
4.2.8 <i>Quality communications</i>	111
4.2.9 <i>Quality structure</i>	114
4.2.10 <i>Customer focus /satisfaction</i>	115
4.2.11 <i>Management information systems (MIS)</i>	118
4.2.12 <i>Policy and strategic planning</i>	121
4.3 IMPEDIMENTS TO TQM ADOPTION.....	125
4.4 IMPEDIMENTS TO TQM ADOPTION IN DEVELOPING COUNTRIES	128
4.5 TQM BENEFITS	132
4.5.1 <i>The role of TQM in achieving competitiveness</i>	133

4.5.1.1 Improved profitability	138
4.5.1.2 Increase market share.....	140
4.5.1.3 Improve the quality of products and services	141
4.5.1.4 Improving company effectiveness	143
4.6 ENVIRONMENTAL STAKEHOLDERS' ROLE IN TQM IMPLEMENTATION	144
4.7 ENVIRONMENTAL STAKEHOLDERS' ROLE IN TQM IMPLEMENTATION IN DEVELOPING COUNTRIES.....	148
4.8 HISTORY OF THE DEVELOPMENT OF QUALITY MANAGEMENT IN JORDAN	150
4.9 CHAPTER SUMMARY RESEARCH METHODOLOGY	155
5.1 INTRODUCTION	155
5.2 RESEARCH AIMS AND OBJECTIVES	155
5.3 RESEARCH QUESTIONS	156
5.4 RESEARCH DESIGN.....	157
5.5 RESEARCH PHILOSOPHY	158
5.6 RESEARCH APPROACH.....	164
5.7 RESEARCH STRATEGY	165
5.8 TIME HORIZON	166
5.9 DATA COLLECTION METHODS	167
5.9.1 <i>Questionnaires</i>	168
5.9.1.1 <i>Questionnaire sample</i>	170
5.9.1.2 <i>Developing questionnaire</i>	172
5.9.1.3 <i>Questionnaire wording</i>	172
5.9.1.4 <i>Measurement scales</i>	174
5.9.1.5 <i>Questionnaire layout</i>	176
5.9.1.6 <i>Translation of the research questionnaire</i>	177
5.9.1.7 <i>The contents of the questionnaire</i>	177
5.9.1.8 <i>Piloting the questionnaire</i>	178
5.9.1.9 <i>Response rate</i>	179
5.9.2 <i>Semi-structured interviews</i>	181
5.9.2.1 <i>Semi-structured interviews sample</i>	183
5.10 VALIDITY AND RELIABILITY EVALUATION	185
5.11 FIELDWORK PROCESS.....	189
5.12 DIFFICULTIES IN CONDUCTING THE FIELDWORK	192
5.13 DATA ANALYSIS	192

5.13.1 Statistical methods.....	192
5.13.2 Qualitative data analysis.....	193
5.14 CHAPTER SUMMARY	194
Chapter Six Presentation of the findings.....	197
6.1 INTRODUCTION	197
6.2 CHARACTERISTICS OF RESPONDENTS	197
6.3 THE CHARACTERISTICS OF PARTICIPANTS' COMPANIES	199
6.4 DATA ANALYSIS PRESENTATION	201
6.4.1 First objective: To assess the adoption of TQM in the ICT sector in Jordan.....	201
6.4.2 Second objective: To examine the impact of TQM implementation to improve competitiveness	210
6.4.2.1 The hypothesis test.....	213
6.4.2.2 Significant difference across companies: business type and company size	234
6.4.3 The third objective is to explore the role of the environmental factors to encourage the implementation of TQM	238
6.4.4 Fourth objective: To identify the main impediments of the adoption of TQM.....	242
6.5 CHAPTER SUMMARY	245
Chapter Seven Discussion of Overall Quantitative and Qualitative Data and Findings.....	247
7.1 INTRODUCTION	247
7.2 CHARACTERISTICS OF THE SAMPLE: RESPONDENTS AND COMPANIES.....	248
7.2.1 The participants' gender, age and education levels.....	248
7.2.2 The participants' work experience in the field of TQM.....	249
7.2.3 The participants' job titles	250
7.2.4 The ownership of the participant companies.....	251
7.2.5 Region (Market)	251
7.2.6 Standardizations.....	252
7.2.7 Number of employees	252
7.2.8 Companies business type.....	253
7.3 DISCUSSION OF THE FINDINGS.....	254
7.3.1 First objective.....	254
7.3.2 Second objective.....	277
7.3.2.1 Company's business type and competitiveness achieving.....	288
7.3.2.2 Company's size and competitiveness achieving.....	289
7.3.3 Third objective.....	290
7.3.4 Fourth objective: To identify the main impediments of the adoption of TQM in the ICT sector in Jord.....	294
7.4 CHAPTER SUMMARY	298

Chapter Eight Conclusions, Contributions and Recommendations	300
8.1 INTRODUCTION	300
8.2 CONCLUSIONS	300
8.2.1 <i>Conclusion of objective one</i>	300
8.2.2 <i>Second objective</i>	304
8.2.3 <i>Third objective</i>	305
8.2.4 <i>Fourth objective</i>	305
8.2.5 <i>Presenting the proposed model</i>	307
8.3 CONTRIBUTIONS	312
8.3.1 <i>Academic contributions</i>	312
8.3.2 <i>Empirical contributions</i>	313
8.4 RECOMMENDATIONS	315
8.5 RECOMMENDATIONS FOR FURTHER RESEARCH.....	316
8.6 RESEARCH REFLECTIONS AND LIMITATIONS	317
References	319
Appendices.....	365

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List of tables

<u>Tables</u>	<u>page no</u>
Table 3.1 The various stages of TQM development	46
Table 3.2 Juran's Six Steps to Problem Solving	51
Table 3.3. Consumer perceptions of and business approaches towards quality	68
Table 4.1 Differences between individualism and collectivism	86
Table 4.2 comprehensive list of quality factors and literature support	124
Table 5.1 Contrasting implications of positivism and social constructionism.....	160
Table 5.2 The strengths and weaknesses of research philosophies.....	163
Table 5.3 Advantages and disadvantages of open-ended and closed-ended questions.....	173
Table 5.4 Independent and dependent variables Cronbach's alpha results.....	188
Table 6.1 The characteristics of respondents	198
Table 6.2 The Characteristics of companies	200
Table 6.3 Top management commitment.....	202
Table 6.4 Quality communications and structure	203
Table 6.13 the interviews results of TQM factors implementation	209
Table 6.14 correlation results.....	214
Table 6.15 Coefficient results for dependent variable profitability	216
Table 6.16 coefficients results for dependent variable profitability	216
Table 6.17 Rules of thumb about correlation coefficient size*	217
Table 6.18 ANOVA output for the first hypotheses	220
Table 6.19 Correlation	222
Table 6.20 Coefficients results of dependent variable market share	223
Table 6.21 Market share ANOVA result	224
Table 6.22 Correlation results	226
Table 6.23 Dependents variable effectiveness coefficients	227

Table 6.24 Effectiveness ANOVA result.....	228
Table 6.25 correlation result	231
Table 6.26 Dependent variable service quality coefficient.....	232
Table 6.27 Service quality ANOVA result	232
Table 6.28 Ten TQM factors Pearson correlation result.....	235
Table 6.29 The correlation between TQM factors and competitiveness	236
Table 6.30 interview result regarding the impact of TQM on competitiveness.....	237
Table 6.31 the government roles in encouraging TQM implementation	239
Table 6.32 the role of social culture in encouraging TQM implementation	240
Table 6.33 interview findings regarding the positive and negative aspects effect on TQM implementation.....	242
Table 6.34 the questionnaire results regarding TQM implementation impediments.....	243
Table 6.35 The interview results regarding TQM implementation impediments.....	245
Table 8.1 comparison critical success factors for TQM implementation in different nation.....	304
Table 8.2 comparison of impediments for TQM implementation in different nation	306
Table 6.5 Employee empowerment and training	374
Table 6.8 Customer satisfaction.....	375
Table 6.9 Organisational culture	375
Table 6.10 Quality information systems	376
Table 6.11 Policy and strategy planning	377
Table 6.12 Supplier's relationships.....	377

List of figures

<u>Figures</u>	<u>page no</u>
Figure 1.1 The thesis layout	20
Figure 2.1 Jordanian climate	23
Figure 2.2 ICT Spending as a Percentage of GDP 2003	32
Figure 2.3 Mobile Penetration in the Levant Region 2004	36
Figure 3.1 Major obstacles to implementing Deming's philosophy	49
Figure 3.2 Baldrige Model	62
Figure 5.1 Triangulation of qualitative data.....	162
Figure 5.2 Deductive and inductive approaches to the relationship between theory and research	164
Figure 5.3: Research Method Conceptual Framework	196
Figure 6.1 First Hypotheses Residual analysis for backward elimination model	218
Figure 6.2 First hypotheses residual analysis for backward elimination model.....	222
Figure 6.3 Second hypotheses residual analysis for backward elimination model.....	224
Figure 6.4 Second hypotheses residual analysis for backward elimination model.....	225
Figure 6.5 Third hypotheses residual analysis for backward elimination model.....	229
Figure 6.6 Third hypotheses residual analysis for backward elimination model.....	229
Figure 6.7 Fourth hypotheses residual analysis for backward elimination model.....	233
Figure 6.8 Fourth Hypotheses residual analysis for backward elimination model	234
Figure 8.1 Summary of the study's proposed model	310

Chapter One

Introduction

1.1 Introduction

The purpose of this introductory chapter is to provide the reader with an overview of the research that is presented through the body of this work. The chapter has been divided into three sections. The first section aims to provide the reader with the background and need for study. The second section presents the research objectives, and the overall organisation of the thesis is presented in section three.

1.2 Background and need for the study

To survive and compete in the rapidly changing business environment many organisations around the world have been forced to employ new philosophies to improve their organisational performance. Many of these philosophies have total quality management (TQM) at their core. TQM emerged in 1980 in the U.S.A, providing a structure for a competitive response to the growing dominance of Japanese manufacturers. Although there is much evidence in the literature of research being carried out in established economies, it is evident that there is a limited amount of research being undertaken concerning TQM in developing countries. Gosen et al. (2005, p452) stated that:

“A number of gaps are identified in the literature on quality management in developing countries along with significant challenges including differing perceptions of quality”.

Moreover, Sila and Ebrahimpour (2002) added that many analytical studies conducted in different countries show that there is a scarcity of information about the nature and stage of TQM implementation in other regions of the world including South America, Africa and the Middle East. Therefore, the study described in this thesis adds to the

knowledge of the field in that it demonstrates a new perspective related to the previously un-researched environment of the Jordan ICT sector, also making a contribution to the wider TQM literature.

Reviewing the literature published in Europe it could be seen that there were many companies operating on the Internet, a main part of the ICT sector, which were suffering from financial loss and failure. For instance, the Wall Street Journal Europe (2001) reported that a total of 555 Internet companies have shut down since January 2000 (Kemmler et al., 2001). Many attempts have been made by authors to illustrate the weaknesses and strengths within such organisations. The focus of this previous work was to understand why companies fail, by demonstrating the potential benefits of applying the concept of TQM to virtual operating environments (Alomaim et al., 2003). Aboelmaged and Tunca (2000) point out that the Internet companies, as with many other virtual organisations, suffer not only from financial problems, but are also challenged by many internal and external threats. These threats are potential crises that may be responsible for final closure. Alomaim et al., (2003 p. 669) explained the reasons behind this failure when he said:

“It is significant for the Internet companies to focus on unconditional customer satisfaction. Many Internet companies have yet to practice TQM principles”.

This study has been applied in Jordan, which is one of the developing countries in the Middle East. Jordan is located in the heart of a conflict-ridden and unstable region, a key issue in the business environment. The Arab Bank Review (2004) stated that Jordan suffers from a shortage of financial and natural resources, although trade and service-related industries account for more than two-thirds of its gross domestic product. This lack has caused high public debt, scarcity of foreign and local investments, poverty and unemployment. Unemployment is potentially the most socially significant of these problems with the unemployment rate reaching 14.8% in 2005 against 12.5% in 2004 (Central Bank of Jordan 2006). All these aspects negatively affect the Jordanian business environment.

In spite of previously mentioned challenges, the information and communications technology (ICT) sector in Jordan achieves advanced levels of performance and competitiveness not only in the Arab world but also in the Middle East. Jordan is considered as an example of a nation state trying to develop, based on using ICT in an increasingly globalised world (Al-Jaghoub and Westrup, 2003). The industry has the potential to generate a competitive advantage and to play an important role in the development of other technological based industries. It is engaged in a number of initiatives in order to pave the way for the country to become a regional IT centre (Nusseir, 2001).

Building on the previous discussion, there are significant questions that must be raised. These pertain to the currently successful ICT companies in Jordan and whether they face the same potential state of failure; if not, how these companies could maintain their current success long term. Therefore, this study provides an evaluation of TQM implementations in the Jordanian ICT sector and has identified the critical impediments to successful TQM implementation there. The value of this study comes from addressing the lack of research that has been undertaken in TQM in Jordan and, more specifically, in the ICT sector.

Several non-Jordan specific studies, such as Al-khalifa and Aspinwall (2000), Chapman and Al-Khawaldeh (2002), Alomaim (2002), Abu-Hamatteh et al (2003), Baidoun (2004) and Al-Qudah (2006) carried out in the Middle East, indicate that there are nine common TQM factors (top management commitment; quality communications and structure; employee empowerment and training; continuous improvement; customer focus; quality measurement and benchmarking; policy and strategic planning; organisational culture; supplier's relationship) and that these factors have been applied to studies in similar environments of developing countries in general, and in the Arab world in particular.

It is worth mentioning that none of these studies investigated the role that quality information systems (QIS) play in successful TQM implementation. Also, there is no clear evidence that the role of this factor in applying TQM has been studied in the Arab world. Therefore, the researcher in the present study investigated the role of these nine TQM factors, plus the role of quality information systems.

Moreover, as a result of the importance role that competitiveness plays in keeping and maintain business success, this study is considered as an attempt to explore the impact of TQM implementation on companies' competitiveness in the Jordanian ICT sector.

Mersha and Robert (1997, p.666) expressed a concern in this regard when they said:

“Many organisations are now using quality as a competitive weapon. Improved quality results in increased productivity and profitability and strengthens the firm's competitive position in the market”.

Several studies demonstrate that TQM achieves competitive advantage as evidenced by superior financial performance (e.g., Lemak et al., 1997). As described by Deming (1982), the central objective of TQM is to develop and sustain a competitive advantage through achieving the utmost efficiency. TQM is a business strategy that leads to achieving competitive advantage when properly implemented (El Shenawy et al 2007). Reed et al. (2000) argued that TQM is considered a business strategy that accomplishes a sustained inimitable competitive advantage for the organisation.

Governments have a positive or negative impact on the functioning of human resource practices and training programmes (Ehrenberg and Stupak, 1994). However, Gosen et al, (2005) stated that governments in developing countries can more effectively help in enhancing local capability without diminishing quality by being more efficient themselves, by providing financial and technology support and by making industrial development an important priority. He also emphasised the cultural social issues and the role that they play in TQM implementation. However, it is worth mentioning that a number of gaps have been identified in the literature concerning the role of government effect on TQM implementation in developing countries. Therefore, the study aims to

explore the role of the external environment in TQM implementation in Jordanian ICT companies.

1.3 Research aim and objectives

The overall aim of this study is to investigate the current state, and subsequently to develop a model to assist the implementation, of TQM in ICT companies in Jordan. In order to achieve this aim five objectives were developed.

1. To assess the adoption of TQM factors in the Information and Communications Technology (ICT) Sector in Jordan. The factors of TQM included in the investigation are: top management commitment; quality communications and structure; employees empowerment and training; quality measurement and benchmarking; continuous improvement; customer focus and satisfaction; policy and strategic planning, organisational culture; quality information systems; suppliers relationships.
2. To explore the impact of TQM implementation on improving companies' competitiveness through profitability, service quality, effectiveness and market share.
3. To explore the role of environmental factors (government policy and social culture) in encouraging the implementation and sustainability of TQM in the Jordanian ICT sector.
4. To identify the main impediments of the adoption of TQM in the ICT sector in Jordan.
5. To propose practical suggestions and recommendation to support the adoption of TQM and tackle the problems and challenges which exist in the ICT sector in Jordan.

1.4 Layout of the study

This thesis is divided into eight chapters, as shown in Figure (1.1). Chapter one provides an introduction to the study including, the background and need for the study, research aim and objectives and layout of the study. In addition to the introductory chapter, this thesis consists of seven further chapters.

Chapter two: A brief look at the Hashemite Kingdom of Jordan and its ICT sector

This chapter aims to familiarise the reader with the Hashemite Kingdom of Jordan, where the empirical study has been conducted. It has been divided into two sections. The first section proposes to provide general information about Jordan and its geography, climate, religion, educational background, and economic background. The second section is a brief review of the population of the study, the Information and Communication Technology Sector (ICT) in Jordan, and consists of the following sections: the history of ICT in Jordan; the importance of it; the role of ICT in Jordanian economy; the Telecommunications Regulatory Commission (TRC); the types of services presented by ICT in Jordan.

Chapter three: The fundamental issues of TQM

The purpose of this chapter is to provide the reader with an overview of the literature on TQM and present the fundamental and different issues of TQM that are related to this study. This chapter includes the concept of quality and TQM and debates its definitions, a brief history of TQM and its roots and transition from the concept of quality to Total Quality Management, quality gurus and their contributions, quality management approaches, models of TQM implementation, ISO 9000, criticisms of TQM.

Chapter four: The implementation of quality factors and issues of TQM

This chapter reviews the critical factors of TQM implementation most often identified by the research, supported by the writings of quality practitioners and authors. The factors that are included this chapter are: leadership; employee empowerment and training; customer satisfaction; quality communications and structure; quality measurement and benchmarking; continuous improvement; organisational culture; quality information systems; policy and strategic planning; suppliers' relationships. In addition, the influence of TQM implementation on the competitiveness of companies in the ICT sector, the role of external environment in encouraging TQM implementation, and the impediments of TQM implementation in general, and in developing countries in particular, will be given special attention, and the history of quality management in Jordan.

Chapter Five: Research methodology

The aim of this chapter is to discuss the research methodology that was used when undertaking this research to assess the extent to which the Jordanian Information and Communications Technology Sector applies TQM to achieve that objective. The study combines two commonly used research methods: the quantitative method and the qualitative method. In general, two methods are used to collect the data; namely, a survey questionnaire and semi-structured interviews. The questionnaire aims to investigate the implementation of TQM in the Jordanian ICT sector, while the interview method is mainly used to explain themes that have emerged from the use of a questionnaire. The two methods are viewed as complementary to each other; the strengths and weaknesses of each method are also considered.

Chapter Six: Presentation of the findings

The analysis of the data that was obtained from the self-administered questionnaire and the face-to-face semi-structured interviews in relation to the research's objectives

respectively are presented within this chapter. The chapter is divided into four main sections. The first one aims to assess the extent of the adoption of the TQM factors in the ICT sector in Jordan. The second section deals with examining and exploring the impact of TQM implementation as an independent variable to improve companies' competitiveness as a dependent variable. The third section aims to explore the role of the environmental factors to encourage the implementation and sustaining of TQM in the Jordanian context. Finally, the fourth section deals with identifying the main impediments of TQM adoption in the ICT sector in Jordan.

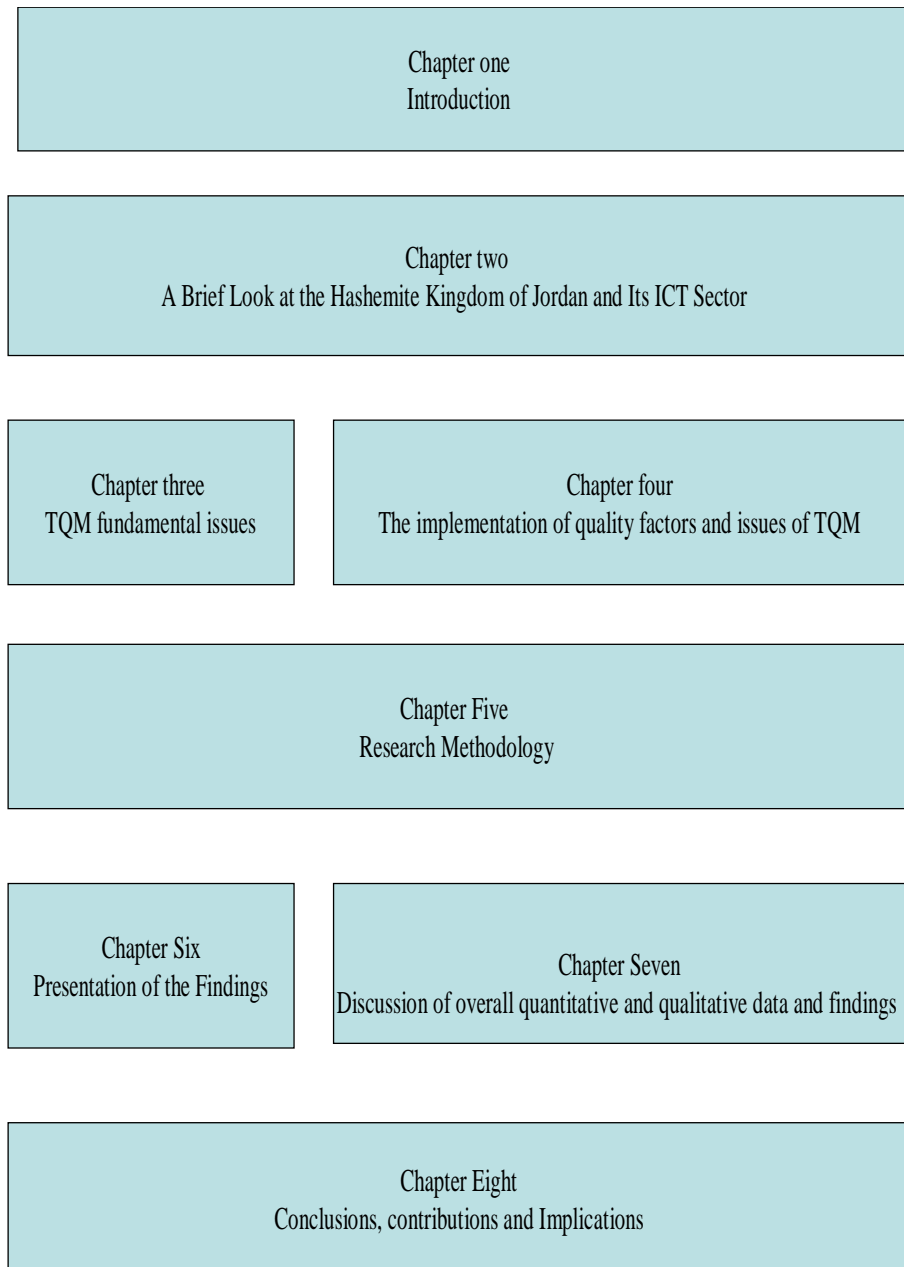
Chapter Seven: Discussion of the overall quantitative and qualitative data and findings

This chapter aims to explain the findings and results that have emerged from the data presented within the context of the current study and previous ones. It presents the interpretation, triangulation and reflection of the quantitative and qualitative results presented in the chapter findings. Furthermore, comparative related studies are introduced in the chapter, especially the ones that have been conducted in developing countries, particularly in Jordan.

Chapter Eight: Conclusions, contributions and recommendations

The purpose of chapter eight is to summarise the conclusions for each objective of this research which emerged from the analysis in the chapter findings and the discussion chapter. As a main aim of the research, a model to help in the implementation of TQM in the ICT companies in Jordan was developed and presented within this chapter. Moreover, this chapter presents the contribution of the study for academic and practitioners. Also, recommendations for further research are presented. Then, reflections and limitations are presented. Figure 1:1 illustrates the structure of the thesis.

Figure 1.1 The thesis layout



Chapter Two

A Brief Look at the Hashemite Kingdom of Jordan and Its Information and Communication Technology ICT Sector

2.1 Introduction

This chapter aims to provide the reader with the background of the country in which this study is conducted. It consists of two parts; the first one is a brief review of Jordan consisting of the following sections: the geography and climate; religion; education; economy. The second part is a brief review of the population of the study, the Information and Communication Technology sector (ICT) in Jordan, and consists of the following sections: the history of ICT in Jordan; the importance of it; the role of ICT in Jordanian economy; the Telecommunications Regulatory Commission (TRC); the types of services presented by ICT in Jordan. A summary of the chapter is presented as a conclusion.

2.2 Jordan: General Overview

2.2.1 Geography and climate

Jordan has a mixture of Mediterranean and dried desert climates, the north and west of the country prevailing Mediterranean climates, while most of the country is desert. Generally, the country has warm, dry summers and mild, wet winters, with annual average temperatures ranging from 12 to 25 C (54 to 77 F) and summertime highs reaching the 40s (105-115 F) in the desert areas. Rainfall averages vary from 50 mm (1.97 inches) annually in the desert to as much as 800 mm (31.5 inches) in the northern hills, some of which falls as snow. Central Bank of Jordan, (2007) reported that Jordan can be divided into three physiographic regions, each with a distinct climate.

- 1- The highlands comprise mountainous and hilly areas located through Jordan from north to south. Many valleys and riverbeds intersect the highlands and eventually flow into the Jordan River, the Rift Valley or the Dead Sea. The highlands are by no means uniform. Their altitude varies from 600 to 1600 metres (1969 - 5249 feet) above sea level, and the climate, although in general wet and cool, also differs from one area to another. It is in the highlands that the major remains of old civilizations are found in the cities of Jerash, Petra, Philadelphia (known today as Amman), Madaba, and Gadara (known today as Umm Qais) and Al-Karak. Fruit trees, vegetables and cereals are planted in the highlands.
- 2- West of the highlands is the Jordan Rift Valley, which is also located along the entire length of Jordan. The Rift Valley plunges to over 400 meters (1312 feet) under sea level at the Dead Sea, becoming the lowest spot on earth, and reaches a minimum width of 15 kilometers (9.3 miles). The Rift Valley encompasses the Jordan Valley the Dead Sea, Wadi Araba and Aqaba. The Rift Valley is very rich in water resources, including thermal mineral water. The valley is rich in agricultural land and is warm throughout the year. The Rift Valley ends in the south at Aqaba, a tropical resort surrounded by mountains. Aqaba enjoys a warm, sunny climate throughout the year and is a tourist destination sporting some of the world's most spectacular underwater life.
- 3- The desert area in east Jordan is an extension of the Arabian Desert, and forms nearly two-thirds of the country. It is not a real desert; there is low rainfall and small plants survive in winter and spring. This area is home to the bedou of Jordan, the traditional sheep and goat herders who provide meat for the rest of the country. The climate of the desert differs between day and night, and between summer and winter. Figure 2.1 shows these different climates (Central bank of Jordan, 2007).

Figure 2.1 Jordanian climate



2.2.2 Religion

Islam is the official religion in Jordan. It is a much more important cultural issue than in the west. The demographics of Jordan show that about 90% of Jordanians are Sunni Muslims and are 2% Shia Muslims. Christians make up 6% of Jordan's population, 2% are varying among Greek Orthodox, Catholics, Coptics, and other (Greenway and Simonis, 2000).

2.2.3 Education

The Education System

The development of the education system in Jordan can only be described as dramatic. Starting from almost nothing in the early 1920s, Jordan has forged a comprehensive, high-quality system in order to develop the human capital of its population. All villages and communities with 10 or more school-going children are provided with a school, enabling the population in poor and remote areas to get access to education. Education is free for all primary and secondary school students and compulsory for all Jordanian children to the age of fifteen. Jordan has achieved over 95% enrolment for its school age children. Jordan's policy of favouring spending on basic education over higher education has facilitated the country's aim to increase universal enrolment and has

boosted literacy levels throughout the general population. The kingdom's education record has proven impressive by international standards and results from the foresight of the country's leadership who saw, and continue to see, the need to focus on building the country's human capital to meet the challenges of the future (A Higher Education Cooperation Scheme between EU Member States Partner Countries, 2007).

The education system in Jordan comprises a 12-year comprehensive programme divided into four parts: nursery, kindergarten, basic and secondary.

The basic part lasts from grades 1 to 10. At the end of grade 10 the grades of each student for the previous three years, 8th, 9th and 10th, are calculated to determine in which secondary stream (academic or vocational) that students can continue. Often, the student's wishes are taken into account, but the final decision rests with the Ministry of Education. The secondary part of two years is divided into two main streams. The first stream is the comprehensive secondary education stream that ends with a general secondary education examination, the Tawjihi, and consists of a common core curriculum and optional specialized academic or vocational courses. The second stream is the applied secondary educational stream which consists of specialized vocational courses; these prepare skilled labour through apprenticeship programmes run by the Vocational Training Corporation or the Ministry of Education (Department of Statistics, 2006).

Higher Education

Access to higher education is open to holders of the general secondary education certificate who can choose between community colleges (private or public) or university (private or public). Higher education in Jordan started in the second half of the twentieth century, in other words in the sixties, when numerous teachers' colleges were established throughout the nation. Their establishment provided the importance teaching manpower needed to meet the high demand on school education characterizing that

period (A Higher Education Cooperation Scheme between EU Member States Partner Countries, 2007).

Jordan's community colleges offer specialized two- or three-year programmes in various areas of study. All community college students have to pass a comprehensive government exam at the end of their study. Community colleges tend to offer practical education geared towards professions such as education, commerce, computer studies, medicine, pharmacology, hotel management, interior design, social work, nursing and midwifery (A Higher Education Cooperation Scheme between EU Member States Partner Countries, 2007).

Universities in Jordan

In Jordan there are nine public universities and twelve private universities which offer university education in Jordan. The University of Jordan is the first public Jordanian university. It was established in 1962. It was followed in 1976 by Yarmouk University and seven more public universities have been established in different parts of the Kingdom since that date. In 1989 the Council of Higher Education signed the first policy document authorizing the establishment of private universities. The first Jordanian private university was established in 1990, called Amman University, which was followed by twelve more private universities (A Higher Education Cooperation Scheme between EU Member States Partner Countries, 2007).

2.2.4 Economy

Jordan's economy has always been exposed to unfavourable and difficult events and limited resources. Jordan is considered almost landlocked and has inadequate supplies of water, so that it is unsuitable for agriculture. Limited natural resources have prevented economic development. Jordan depends upon foreign aid from its oil rich neighbours. The country is currently exploring ways to improve its limited water supply and use its existing water resources more efficiently, including through regional cooperation. Jordan

also depends on external sources for the majority of its energy requirements. During the 1990s its crude petroleum needs were met through imports from neighbouring Iraq. Since early 2003 oil has been supplied by some Gulf Cooperation Council member countries. In 2006, Jordan signed an agreement with Iraq to resume imports of crude oil. In addition, a natural gas pipeline from Egypt to Jordan through the southern port city of Aqaba is now under process. The pipeline has reached northern Jordan and construction to connect it to Syria and beyond is underway (Fisher, 2004; Robins, 2004; Central Bank of Jordan, 2006).

Jordan is categorized by the World Bank as a "lower middle income country." The per capita GDP, as reported by the IMF, was \$2,317 for 2005. Jordan has recently adopted a programme of economic reform. The government has taken the initiative to gradually eliminate fuel subsidized in 2007, pass legislation targeting corruption and start tax reform. It has also worked to liberalize trade, getting access to the World Trade Organisation (WTO) in 2000, signing an Association Agreement with the European Union (EU) in 2001 and securing the first bilateral Free Trade Agreement between the United States and an Arab country in 2001. Since 2000 exports of light manufactured products, principally textiles and garments manufactured in the Qualifying Industrial Zones (QIZ) that enter the United States tariff and quota free, have been driving economic growth and development. Jordan exported about \$6.9 million in goods to the U.S. in 1997, when two-way trade was about \$395 million; it exported about \$1.1 billion in 2005 and about \$574 million in the first six months of 2006, with two-way trade at almost about \$1.7 billion and about \$850 million, respectively (Central Bank of Jordan, 2006).

The Free Trade Agreement (FTA) with the United States that came into effect in December 2001 will phase out duties on nearly all goods and services by 2010. The agreement also provides suppliers for more open markets in communications, construction, finance, health, transportation and services, and strict application of international standards for the protection of intellectual property as well. In 1996 Jordan

and the United States signed a civil aviation agreement that provides for "open skies" between the two countries and a U.S.-Jordan treaty for the protection and encouragement of bilateral investment entered into force in 2003 (Central Bank of Jordan, 2006).

2.3 Information and Communications Technology (ICT) Sector

Jordan is considered as an example of a nation state trying to develop based on using ICT in an increasingly globalised world (Al-Jaghoub and Westrup, 2003). During the last decade Jordan made an effort to harness ICT in order to develop and build a strong ICT sector. Successive governments have managed to generate the global vision of Jordan as a very modern and highly potential country. Countries surveyed in the World Economic Forum's Global Competitiveness Report for 2004-2005 reveal that Jordan ranked 35 out of 104 and was ranked 51 out of 82 on the network Readiness Index rank in the Global Information Technology Report (Global Information Technology Report, 2004-2005).

Jordan's ICT industry is flourishing and has become a major contributor to Jordan's economy, being one of the more developed and advanced ICT sectors in the developing countries. Jordan's network readiness has been improving, ranking 44 out of 104 countries in 2004 (Global Information Technology Report, 2004 – 2005).

Jordan has the potential to generate a competitive advantage to play an important role in the technological industries and is engaged in a number of initiatives in order to pave the way for the country to become a regional IT centre (Nusseir, 2001).

2.3.1 The History of the ICT Sector

The history of the Information and Communications Technology Sector (ICT) in Jordan can be traced back to early in 1921. After the foundation of the Hashemite Kingdom of Jordan, the Ministry of Post, Telegraph and Telephony was established, which additionally developed the country's telecommunications services. In 1961 the first

automatic telephone switch service was introduced utilizing an electromechanical switch with a capacity of roughly 5000 lines. In 1971 a new government-controlled body, the Telecommunications Corporation (TCC) was established in order to take over the day-to-day running of the communications services such as telephone, telegraph and telex. In addition, a satellite earth station at Baqa was in operation using Intelsat facilities. From 1973 to 1985 Jordan telecom's network underwent important expansion as part of a government investment programme. In 1993 the government had the ability to initiate a development programme known as the National Telecommunications Programme (NTP). TCC became a company and was renamed Jordan Telecommunications Co. and was registered as a private company in January 1997. This date marked a turning point for the company in all its areas of operations, owing to its new administrative and financial independence. The company soon started to make changes and advances to the local, national and international switching systems and the development of ground stations for satellite communications and local area and wide area communication networks, in addition to the introduction of fibre optic technology in the network backbone (Jordan Telecom. Report, 2006).

The Information and Communication Technology sector is quickly evolving into the most dynamic and competitive market in the Arab world. At the end of 2004, with the ending of the fixed line monopoly, the telecom sector gained full liberalization. The open, transparent and competitive environment has led to heightened investor interest in the country's telecom sector. Telecommunications deregulation, which started in 2000, has generated a competitive ICT environment, offering advanced services to consumers with increasingly competitive rates. The use of telecommunications has continually increased with expanded availability. It is estimated that about 82 % of Jordanians have access to telecommunication tools through fixed or mobile lines (Arabian Business.com, 2008).

2.3.2 The Importance of the ICT Sector

ICT provides developing countries with an unprecedented opportunity to meet vital development aims. Those countries that succeed in harnessing the potential of ICT can look forward to greatly expanded economic growth and a dramatic improvement in human welfare (United Nation Development Programme UNDP, 2000-2001).

Jordan's ICT industry has attracted attention from both international and regional IT forces such as Microsoft, Intel, Cisco Systems, France Telecom, Mobile Telecommunications Company (MTC) Vodafone Kuwait, and Bahrain Telecommunications Company. Jordan is well on its way to becoming an ICT hub in the area, having generated a climate for success for local companies and foreign investors (Ministry of Information and Communications Technology, Report, 2006).

1. Modern and liberal economy: Jordan boasts a free market orientation, liberalized trade policies, an ambitious privatization programme and investor- friendly policies and regulations.
2. Committed government and leadership of the government of Jordan, working in partnership with the private sector, have established a long-term plan to build a vibrant ICT industry and transform Jordan into a regional ICT hub. The government continues to fulfil its commitment to protect intellectual property rights, deregulate telecommunications and reform investor tax laws.
3. Growing ICT market and growing regional markets: Jordanian ICT companies have already established a solid regional presence and export base. Jordan is the ideal gateway to Middle East North Africa MENA countries: an area that has more than 350 million customers with a purchasing power that exceeds US\$500 billion.
4. Strong regulatory reform and independent ICT regulator: reform in Jordan's ICT sector is active and on-going. Jordan was the first country in the Arab world to

have a fully liberalized telecommunication market and has modernized 75 % of its ICT-relevant laws, developing the business environment for local firms and investors. Jordan also led the area by establishing the first independent telecommunications regulatory body to generate a fair, transparent and competitive investment environment.

5. Modern, reliable infrastructure: Jordan enjoys a sophisticated communications infrastructure, recognized as well-developed in the Middle East North Africa MENA area. Building on this already developed network, the government is building a nationwide broadband network to connect all public schools, universities and colleges.
6. Committed, technically skilled and growing competitive: wage workforce: ICT experts in Jordan are respected for their reputation of reliability, commitment and entrepreneurship. Resources from the Jordanian government and private sector, and international IT forces, are helping augment an already-qualified workforce with e-learning programmes and other innovative curricula.

Locally and internationally recognized, the Jordanian software industry provides IT solutions in web-based applications, Arabization, banking and financial solutions, system integration, healthcare and insurance solutions and software conversion from third to fourth generation. Clients include banks and financial service institutions, hospitals, insurance companies, universities, telecommunications, hotels and government. Other solutions include e-payment, electronic cheque clearance, auto dealer management systems, hospital management systems, university management systems, Arabic search engines, enterprise resource planning (ERP), call monitoring systems, user interface components, wireless applications, data warehousing, work flow and systems integration (Central Bank of Jordan, 2006).

Saudi Arabia and the Gulf countries are the main Jordan export markets. It also completes outsourced work for the United States and other markets. Jordan also has a

number of US company representatives including Microsoft, IBM, Oracle, Dell, Compaq, HP, US Robotics and Apple.

The private sector is working hand-in-hand with the Jordanian government to develop and improve the government's ambitious, large-scale projects in e-government and e-learning. Jordan's unique private-public partnership model can be applied to local and international markets, providing numerous opportunities for investors. This model is increasing the credibility of the Jordanian ICT industry among investors and business partners locally, regionally and internationally (Ministry of Information and Communications Technology, Report, 2006).

2.3.3 The role of ICT in the Jordanian economy

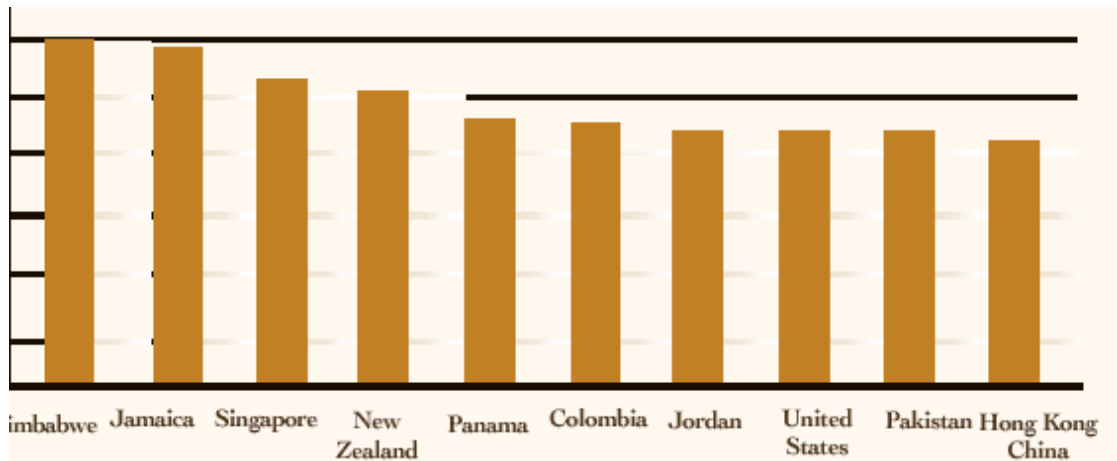
International economy ICTs are credited with their transformative capacity for local economies, companies and the international economy. For developing countries, ICTs are assumed to offer significant potential benefits for socioeconomic development and, thus, represent a promising way to lead developing countries on a path to quicker development (UNDP, 2000-2001). In addition, Jordan is fostering the continued development of a liberal, free market economy and strengthening its macroeconomic growth and stability through its comprehensive economic reforms and restructuring programmes.

Revenues and profits for both telecommunications and IT have steadily increased over the past five years. Telecom gross revenues (fixed and mobile services) more than doubled between 1999 and 2004, increasing from US\$400 million in 1999 to US\$940 million in 2004. IT gross revenues reached US\$440 million in 2004, up from US\$170 million in 2001 (Ministry of Information and Communications Technology, Report, 2006).

Demonstrating its commitment to becoming a "connected" country, Jordan was ranked among the top ten countries in the world in ICT spending as a percent age of GDP in

2003 (World Bank Indicators, 2005). Figure 2:2 shows ICT Spending as a Percentage of GDP 2003.

¹Figure 2.2 ICT Spending as a Percentage of GDP 2003



Source: World Bank Indicators, 2005.

There was a report written at the end of 2006 by The Telecommunications Regulatory Commission (TRC) about investments volume in the ICT sector in Jordan. This report showed that the ICT sector achieved rapid growth in the volume of investments, estimated at about 155.3 million JD in 2005 compared with 111.4 million JD in 2004 (Report issued from TRC, 2006). In addition, the ICT industry has attracted both foreign and regional investment, created high value jobs and produced substantial levels of export. IT domestic revenues reached \$361 million in 2004 up from \$130 million in 2001, and export revenues reached \$79 million in 2004 up from \$40 million in 2001. In 2004 domestic revenues grew by 60% and export revenues by 14% compared to 2003 (Ministry of Information and Communications Technology, Report, 2006).

¹ Note: The data on information and communications technology expenditures cover the world's 70 largest customers of such technology among countries and regions.

Privatization and deregulation has resulted in substantial private sector investments in Jordan's telecommunications infrastructure, which increased from US\$43 million between 1990 and 1995 to about US\$970 million from 1996 to 2003 (Ministry of Information and Communications Technology, Report, 2006).

ICT has a dual role in the international economy: these technologies aim to facilitate quick interconnectivity between places. Equally important, in relation to Jordan and other developing nations, the production of ICT products and services has become highly mobile and, using ICT enabled links, such industries can be sited in nations which otherwise may not find it easy to attract external investment (Al-Jaghoub and Westrup, 2003).

2.3.4 The Telecommunications Regulatory Commission (TRC)

In 1995 Jordan was the first nation in the Arab world to enact a modern telecom law and to establish an independent telecommunications regulatory body, the Telecommunications Regulatory Commission (TRC), improving fairness, transparency, competition and investment. Jordan's legal and regulatory framework for telecommunications and mobile services is continuously updated to meet the dynamic technological changes such as convergence, 3G and all types of wireless communications (Ministry of Information and Communications Technology, Report, 2006).

Telecom deregulation is fostering a multi-provider environment that means more choices to consumers at more competitive prices. It is also generating opportunities for national companies to innovate and investment opportunities for investors.

TRC has many duties and responsibilities (The Telecommunications Regulatory Commission report, 2007)

1. To regulate telecommunications and information technology services in the Kingdom in accordance with the established general policy so as to make sure

the provision of high quality telecommunications and information technology services to users at just, reasonable and affordable prices. In addition, to establish the basis for regulation of the telecommunications and information technology sectors, in accordance with the approved general policy, in such a way that services meet the comprehensive developmental needs of the Kingdom.

2. To specify the minimum level of service quality which must be offered by licensees to meet the needs of users.
3. To protect the interests of users and oversee the actions of persons and licensees to make sure that the circumstances of licenses are observed, including specified service standards, service quality and prices.
4. To stimulate competition in the telecommunications and information technology sectors, relying on market forces, and so regulating them as to sure the effective provision of telecommunications and information technology services and to make sure that its regulations are effective and efficient.
5. To participate in the representation of the Kingdom in meetings, conferences, delegations, workshops and other global gatherings having to do with telecommunications and information technology.
6. To establish technical rules and standards for the interconnection of wire line or wireless equipment, including telecom terminal equipment, with the public telecommunications network and to set the regulation procedures for importing such equipment into the Kingdom with regard to principles prescribed in the effective Standards and Metrology Law.
7. To gather information relevant to the telecommunications and information technology sectors in order to prepare and publish reports, pamphlets and instructions for users, as well as to prepare media programmes in order to increase the public's awareness of the significant of these sectors and their positive impact on the economic and social development of the Kingdom.
8. To assess the need for the adjustment of the level of regulation of any telecommunication service, or specific type or group thereof, with attention to

competition or any other factor that may require such adjustment or forbearance, and to recommend the same to the Board for approval.

2.3.5 The types of services presented by ICT in Jordan

The ICT sector in Jordan presents several types of service. The main significant services are fixed line network, mobile network, internet service providers, and local broadband learning and research networks. The following paragraphs give a brief description of those services, based on a report published by the Ministry of Information and Communications Technology, (2006).

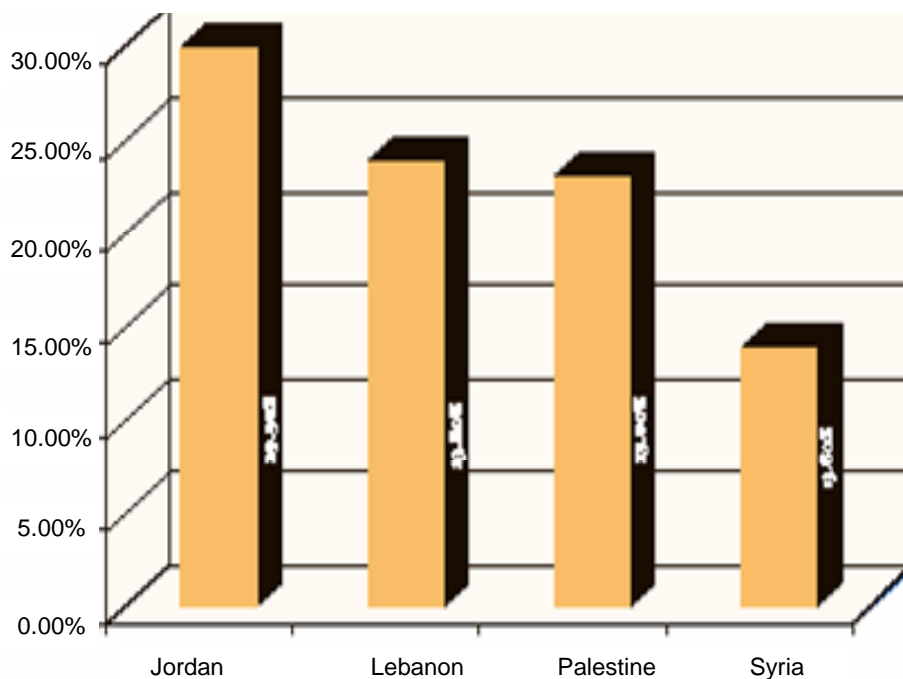
a. Fixed Line Network

Jordan Telecom's network is amongst the most developed telecommunications networks in the Middle East. Global connectivity is mainly through fibre optic cables to neighbouring nations. Second to fibre optic cables are digital radio links and earth stations (two Intelsat and one Arabsat), followed by a submarine cable (Fibre Links Around the Globe FLAG) with a landing station in Aqaba. In May 2005 the TRC awarded Batelco Jordan with the second fixed line license which offers a full range of voice and data services.

b. Mobile Network

In the wireless market, four operators compete to supply infrastructure and services that have driven prices down and increased wireless penetration rates to more than 30% by middle of 2005. Jordan's cellular market is the fastest growing communications segment in the country: the number of subscribers grew from 389,000 in 2000 to about 2 million by middle of 2005. In 2001 mobile penetration overtook fixed line penetration, as shown in figure 2:3.

²**Figure 2.3 Mobile Penetration in the Levant Region 2004**



Source: Arab Advisors Group, Total Country Connectivity report 2004.

c. Internet Service Providers

In 2005 eight ISPs offered Internet services in the Jordanian market. These ISPs offer dial-up Internet, leased lines and Asymmetric Digital Subscriber Line (ADSL) services, Integrated Services Digital Network (ISDN), frame relay, IPVPN services, Internet roaming services and subscription – free Internet (premium numbers). ADSL service with a speed up to two Mbps covered 95 % of populated areas in 2005.

IPVPN services are particularly useful to businesses as they allow local companies to link with all their offices and locations in Jordan for voice and data as if they were in one office, using internal extensions. Furthermore, IPVPN allows global organisations to

² Note: Levant countries are Jordan, Lebanon, Palestine and Syria.

link to over 220 locations around the world in the same way which slashes the costs of global access.

d. National Broadband Learning and Research Network

The National Broadband Learning and Research Network will link about 1.5 million students and teaching staff in Jordan through a modern communications infrastructure between all of Jordan's public universities, mainstream schools, knowledge stations and others. This network will compliment the Kingdom's strategy to modernize its education system through the introduction of ICT as an integral part of the learning process of the Jordanian student.

In 2004 the first component of this network was finalized, linking eight public universities enabling high speed connectivity of 1 gigabit per second. Work continued in the capital city of Amman and throughout the rest of the Kingdom in order to complete the network. Consistently available electricity grid is also being utilized as a backbone for connectivity for economical efficiency (Ministry of Information and Communications Technology, Report, 2006).

2.4 Chapter summary

This chapter aimed to give general ideas about the research context which is Jordan. It provided general information about Jordan and its geographic and climate, religion, educational background, economic. Information about the ICT sector in Jordan which is the study population is also provided within this chapter.

Jordan is an Arab country located in heart of the Middle East. It has a strategic location at the meeting point of Asia, Europe, and Africa. The vast majority of the population is Arab Sunni Muslims. The majority of Jordan's land is desert and lacks natural resource such as oil. Modern Jordan represents a model for the economic and political reforms in the region and it offers an ideal environment for the international investment in different

sectors. The ICT sector in Jordan is very active and in constant growth. This sector has been established in the last few years. It is important in the Jordanian economy. The types of services presented by ICT in Jordan are Fixed Line Network; Internet Service Providers; Mobile Network and National Broadband Learning and Research Network. The next chapter will review the literature on TQM to identify the key fundamental issues of it.

Chapter Three

Total Quality Management Fundamental Issues

3.1 Introduction

This chapter aims to provide an overview of the literature on TQM. It presents the fundamental and different issues of TQM that are related to this study. The chapter includes the different views of the concept of quality and TQM, followed by a brief history of TQM and its roots and transition from the concept of quality to TQM, quality gurus and their contributions, models of TQM implementation, quality management approaches, ISO 9000, and criticism of TQM.

3.2 The concept of TQM

Before discussing TQM as concept it is useful to define the concept of quality: The Oxford Dictionary (1999) defines quality as “*the value and degree of excellence*”. The gurus in the TQM area define quality as:

- conformance to requirements (Crosby, 1979)
- the characteristics through which the product and service meet the expectations of the customer (Feigenbaum, 1983)
- whatever the customer needs and wants (Deming, 1986)
- fitness for use, product features which respond to customer needs, and freedom from deficiencies (Juran, 1951).

All these definitions have one thing in common which is that quality meets the customer needs and expectations that are within an acceptable range of the service or product.

Identifying and defining the TQM concept is not an easy process because the writers in this area have their own definition which suits their beliefs, prejudices, business and academic experience; therefore, there is no specific definition of what TQM is supposed to be. Lau and Anderson (1998) stated that there are no uniformed definitions of what

TQM is. They also stated in the July 1995 special issue of the magazine Quality Progress that there are thirteen articles in TQM and gave twelve different definitions of TQM which means that there is no universal definition of TQM.

Hill and Wilkinson (1995) pointed out that TQM is a 'notoriously imprecise term' and indicated three reasons for this assertion. Firstly, they suggest that the wealth of advice from TQM experts is not supported by sufficient analysis and add that the advice of the experts does not always concur. Secondly, they note that TQM users are not consistent in their use of the term. Finally, as argued by Grant et al (1994), the intellectual origins and part of the theoretical basis of TQM derived from statistics and early applications were in production management, in contrast to most other contributions to management theory which derive from one of the social sciences and have different applications.

Dahlgard et al., (1998) considered quality as a part of the TQM definition. He defined TQM as:

- 1- quality is to continuously satisfy customers' expectations
- 2- total quality is to achieve quality at low cost
- 3- total quality management is to achieve total quality through everybody's participation.

Khan (2003) mentioned that TQM philosophy is based on four basic factors:

- 1- absolute customer focus;
- 2- employee empowerment, involvement and ownership;
- 3- continuous improvement;
- 4- use of systematic approaches to management.

Oakland (2003) defines TQM as a comprehensive approach to apply in order to improve competitiveness, effectiveness and flexibility through planning, organizing and

understanding each activity, and involving each individual at each level. It is helpful in all types of company. In addition, Slack et al. (2007, p 651) define TQM as:

“TQM a holistic approach to the management of quality that emphasizes the role of all parts of an organisation and all people within an organisation to influence and improve quality; heavily influenced by various quality gurus it reached its peak of popularity in the 1980s and 1990s” .

Ross (1999) regarded TQM as an integrated management philosophy and a set of practices that emphasises, among other things, continuous improvement, meeting customer requirements, reducing rework, long-range thinking, increased employee involvement and teamwork, process redesign, competitive benchmarking, team-based problem-solving, constant measurement of results and closer relationships with suppliers.

According to Talha (2004), TQM indicates a broad set of management and control processes designed to focus an entire organisation and all of its employees on providing products or services that do the best possible job of satisfying the customer. Furthermore, Dale (2003, p.26) defined TQM as:

“A management approach that ensures mutual co-operation of everyone in an organisation and associated business processes to produce products and services that meet and, hopefully, exceed the needs and expectations of customers”.

Sashkin and Kiser (1991, 25) have proposed the following:

“TQM means that an organization’s culture is defined by and supports the constant attainment of customer satisfaction through an integrated system of tools, techniques and training. This involves the continuous improvement of organizational processes, resulting in high quality products and services”.

Jeffries et al. (1996, p.15) defined TQM as:

“A comprehensive and integrated way of managing any organisation in order to meet the needs of the customers consistently and achieve continuous improvement in every aspect of the organisation’s activities”

Zairi and Youssef (1995) define TQM as a positive effort by the company concerned to improve structural, infrastructural, attitudinal, behavioural and methodological ways of delivering to the end customer, with focuses on reliability and improvement in quality competitive enhancements, all with the aim of satisfying the end customer.

Slack et al. (2007) mention that TQM should be thought of as a philosophy and a way of thinking and working which particularly stresses the following:

- meeting the needs and expectations of customers;
- covering all parts of the organisation;
- including every person in the organisation;
- examining all costs which are related to quality, especially failure costs;
- getting things “right first time”;
- developing the systems and procedures which support quality and improvement;
- developing a continuous process of improvement.

In summary, researchers in the field of TQM outline the key principles of TQM: commitment management; continuous improvements to organisational processes; employee’s empowerment; motivating employees; providing staff training and development. In addition, benchmarking, tools and techniques should be used to measure quality; the culture of the organisation should support quality and organisation structure. Management and suppliers of the business are also important aspects of TQM. One of the main aims of TQM is to meet the needs of customers and achieve customer satisfaction by providing a quality product or service.

3.3 Evolution of Total Quality Management

The idea of quality has been around for hundreds of years (Flood, 1993). The conceptual root of TQM can be traced to the work of Walter Shewhart in Statistical Process Control

(SPC) at the Bell Laboratories in the United States during the 1920s. Shewhart's concern was to develop a system to measure variables in production. Additionally, he designed the plan-do-check-act cycle, which applied the scientific method to improve the work process (Evans and Lindsay, 2001).

As mentioned by Dahlgaard et al (1998), TQM has developed through four stages which can be categorised as: quality inspection; quality control; quality assurance; total quality management.

3.3.1 Inspection

Quality inspection was adapted to separate non-conforming parts and so the term "Quality" meant inspection. In this era of mass production all finished products were examined to ensure quality. Inspection of quality was developed during the First World War. By World War II the manufacturing systems were more complex and huge numbers of labourers were reporting to each foreman who could quite easily have lost control of the work. As a result, it was necessary to engage full-time quality inspectors (Feigbaum, 1991).

3.3.2 Quality control

During the late 1940s and early 1950s the shortage of civilian goods in the United States made production a main concern. In many organisations, quality remained the area of the experts. During that time both Juran and Deming introduced statistical quality control techniques to the Japanese to assist them in their rebuilding effort. They focused on upper management, rather than quality experts alone. With the support of top managers, the Japanese integrated quality throughout their organisations and developed a culture of continuous improvement. Back in 1951, the Union of Japanese Scientists and Engineers instituted the Deming Prize to reward individuals and organisations who meet stringent criteria for quality management practice.

Under a system of quality control it is expected to find in place paperwork and procedures control system, raw material and intermediate stage product testing, logging of elementary process performance data and feedback of process information to appropriate personnel. With quality control there will be some development from the basic inspection activity in terms of the sophistication of methods and systems, and the tools and techniques which are employed, while the main mechanism for hampering off-specification products and services from being delivered to a customer is screening inspection again. Quality control measures lead to greater process control and lower incidence of non-conformances (Dale, 1994).

3.3.3 Quality assurance

In the third stage finding and solving a problem after a non-conformance has been created is not an effective means of eliminating the root cause of the problem. Under quality assurance continuous improvement can only be achieved by directing organisational efforts towards planning and preventing problems occurring at source. This concept leads to the third stage of quality management development which is quality assurance (Dale, 1994).

3.3.4 Total quality management

Total quality management (TQM) is the fourth level of quality management. TQM is a term that was initially coined by the Department of Defence in the United States (Evans and Lindsay, 2001). TQM is considered as a new managerial concept; it took place in the USA in the early 1980s as a result of poor manufacturing product quality compared with their Japanese competitors (Talha, 2004).

TQM involves the implementation of quality management principles such as continuous improvement, customer focus, honesty, sincerity and care to all aspects of the business, including customers and suppliers. Individual systems, procedures and requirements could be no higher than for a quality assurance level of quality management, but they

will pervade every person, activity and function of the organisation. However, it will require a broadening of outlook and skills and an increase in generative activities from those required at the quality assurance level. The spread of the TQM philosophy is expected to be accompanied by greater sophistication in the implementation of tools and techniques and extra emphasis on people. The process will also extend beyond the organisation to include partnerships with suppliers and customers. Activities will be reoriented to focus on the internal and external customer (Dale, 1994).

By the 1990s quality programmes for productivity and innovation had been intensified to respond to new, often harsh, world conditions and contingencies. Quality management provided the basis for “a new approach in business management for the turn-around” (Mangelsdorf, 1999).

Dale (1994) stated that TQM is the mutual collaboration of everybody in a company and associated business processes and produces products and services which meet customers’ needs and their expectations. TQM is both a philosophy and a set of guiding principles for managing an organisation. Despite the divergence of views of what constitutes TQM among those writing on the subject, it comprises a number of key elements:

- customer orientation
- commitment and leadership of senior management
- planning and organisation
- using quality management techniques and tools
- education and training
- involvement and teamwork
- measurement and feedback
- culture change.

The definition and design of process were reformulated in response to global competition, increased technological complexity, more elaborate sequences of

operations and increased division of labour within companies. Quality engineering and control factors were transferred and integrated throughout companies: “every department manager and every employee is now responsible for his results and deliverables” and TQM has evolved in combination of (sic) theoretical elements through to the present to provide the basis of current integrative management (Mangelsdorf, 1999). Table 3.1 shows the characteristics of the different stages in TQM, as summarised by Dahlgaard et al., (1998).

Table 3.1 The various stages of TQM development

Stage	Characteristics
Quality inspection (1910)	Salvage Sorting Corrective action Identify sources of non-conformance
Quality Control (1924)	Quality manual Performance data Self-inspection Product testing Quality planning Use of statistics Paperwork control
Quality Assurance (1950)	Third-party approvals Systems audits Quality planning Quality manuals Quality costs Process control Failure mode and effect analysis Non-production operation
Total Quality Management (1980)	Focused vision Continuous Improvements Internal costumer Performance measure Prevention Company-wide application Inter-departmental barriers Management leadership

Source: Dahlgaard et al, (1998, pp10)

3.4 Quality gurus and their contribution

The conceptual root of TQM can be traced to Walter Shewhart's work in Statistical Process Control (SPC) at the Bell Laboratories in the United States during the 1920s. Shewhart had a concern about developing a system to measure variables in production. Moreover, he designed the plan-do-check-act (PDCA) cycle which implemented the scientific method in order to improve the work process (Evans and Lindsay, 2001).

Shewhart's early work on the statistical control of processes and the control chart established a foundation for the quality of management movement. He focused on the need for statistical analysis to generate enough understanding of work processes that was clearly seminal for grasping the essence and causes of variation, both controlled and uncontrolled (Bank, 1992). Following Shewhart's innovations the three gurus in the quality movement emerged. They are all Americans – Edward W. Deming, Joseph M. Juran, and Philip B. Crosby (Evans and Lindsay, 2001).

Gurus have contributed to the thinking and practice of the quality improvement movement in two ways. Some of them concentrated on the philosophical aspects of quality improvement and others concentrated on the tools of quality. However, Crosby, Deming, Feigenbaum, Ishikawa and Juran can be considered the most important gurus of the quality management movement (Martinez-Lorente et al, 1998). The following section discusses the work of these pioneers and the work of Taguchi, Shingo, Oakland and Moller as well.

W Edwards Deming

Deming is considered by many researchers as the founding father of the quality movement (Beckford, 2002). Deming began on quality endeavour in the 1940s. He focused on the earlier statistical sampling techniques, based on the work of W A Shewhart. Shewhart was a statistician from the famous Bell Laboratories who had made an early major forward on the development of control charts (Flood, 1993). Bank (2000)

indicated that Deming's approach to quality was built on Shewhart's work and aimed at understanding the causes of two types of variation:

- 1- uncontrolled variation which is due to assignable or special cause
- 2- controlled variation which is due to unassignable, chance, random or common causes.

Flood (1993) indicated that Deming's efforts are documented in *The Economic Control of Quality of Manufactured Product* published by Van Nostrand in 1931. Deming progressed beyond statistical methods and survey work. He formulated a systematic approach to problem solving. The PDCA cycle has become known as the four main components: to plan, to do, to check and to carry out action. Once these stages have been systematically completed the cycle starts again with additional planning.

Deming's review of his quality management philosophy comprises four areas.

Application for a system. This means that all organisation members have to recognize the constituent parts of the system in which they work and the variety of interrelationships that occur; a failure in one part of the system has an effect on success in another part.

Knowledge of statistical theory. This requires that all workers are familiar with the general methods of statistics and are able to apply them effectively.

Theory of knowledge. This relates to effective planning and implementation of those plans to determine what works and what does not.

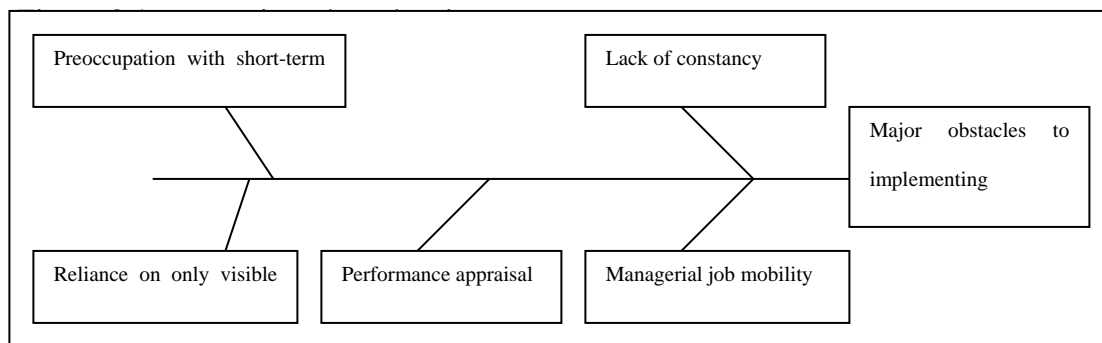
Knowledge of psychology. Quality development requires changes in people's attitudes, values and behaviours. Consequentially, management and workers alike have to recognize what drives people and how those drives can be tapped for the ongoing development of quality (James 1996).

Bank (2000) stated that there are four major obstacles to implementing Deming's philosophy. These major barriers are the lack of constancy, preoccupation with short-

term profits, the many forms of performance appraisal, the mobility of management and their reliance on only visible figures as criteria for success.

Lack of constancy is Deming's phrase for it. It is indicated by the other writers that there a great changeability in management today shifting from one theory to another with alacrity. The valid aspects of each of the management ideas get invalid because they are applied in a piecemeal way with frequent moves from one idea to another. Lack of management constancy occurs when managers fail to make the cultural or organisational changes required for new ideas to flourish and when managers pay only lip-service to the new idea and push faulty products out of the door when under pressure Bank (2000).

Figure 3.1 Major obstacles to implementing Deming's philosophy



Deming believes that there are 14 important points of action required to tackle head-on the diseases plaguing North American industry:

1. create constancy of purpose for the improvement of product and service
2. adopt the new philosophy
3. cease dependence on mass inspection
4. do not buy on the basis of price tag alone
5. improve constantly and forever the system of production and service
6. institute training
7. institute leadership

8. drive out fear
9. break down barriers between departments
10. eliminate slogans and exhortations for the workforce
11. eliminate numerical quotas, managing by the numbers and management by objectives
12. remove the barriers that rob people of pride of workmanship
13. encourage education and self-improvement for everyone
14. take action to accomplish the transformation.

Joseph M. Juran

Joseph M Juran, another pioneer of sound quality management practice, advocated a trilogy of quality planning, quality control and quality improvement (Flood, 1993). He added that Juran's trilogy entailed the processes of:

1. quality planning: the process of preparing to meet quality goals
2. quality control: the process of meeting quality goals during operations through evaluation of performance and taking corrective action
3. quality improvement: the process of breaking through unprecedented levels of performance by reducing waste, improving delivery, enhancing employee satisfaction, ensuring greater customer satisfaction, and so on.

Juran joined the Western Electric Company in the 1920s as it pioneered statistical methods for quality control. He taught quality principles to the Japanese in the 1950s and was a driving and principal force in their quality reorganisation. Juran defined quality management as: quality is fitness for use. Juran believed that about 80% of quality defects were caused by factors controllable by management (Flood, 1993). As mentioned by James (1996) this concept (quality is fitness for use) is based on five quality characteristics:

- technological (e.g. strength)
- psychological (e.g. beauty)
- time-oriented (e.g. reliability)
- contractual (e.g. guarantees)
- ethical (e.g. sales staff courtesy).

James (1996) reported that Juran focused on quality improvement. He determined that the objective was to increase performances to levels that have not been achieved before. In order to do this he suggested that companies must achieve a series of breakthroughs in attitude, organisation, knowledge, culture patterns and results. He developed six phases of problem solving. Quality improvement consists of: identifying the project; establishing the project; diagnosing the cause; remedying the cause; holding the gains; replicating and nominating. Table 3.3 shows Juran's six steps to problem solving as summarised by James (1996, P56).

Table 3.3 Juran's Six Steps to Problem Solving

No	Steps	Activities
1	Identify the project	<ul style="list-style-type: none"> •Normal projects •Evaluate projects •Select a project •Ask : "Is it quality improvement" •Prepare a mission statement
2	Establish the project	<ul style="list-style-type: none"> •Select a team •Verify the mission •Analyse symptoms
3	Diagnose the Cause	<ul style="list-style-type: none"> •Confirm /modify mission •Formulate theories •Test theories •Identify root cause (s) •Identify alternatives
4	Remade the cause	<ul style="list-style-type: none"> •Design remake •Design controls •Design for culture •Prove effectiveness •Implement •Design effective controls
5	Hold the Gains Replicate and nominate	<ul style="list-style-type: none"> •Foolproof the remake •Audit the controls •Replicate the results
6	Replicate and nominate	<ul style="list-style-type: none"> •Nominate the new project

Source: James (1996, p.65)

Juran's philosophy can be summarised into five key beliefs (Beckford, 2002):

- management is largely responsible for quality ;
- quality can only be improved through planning;
- plans and objectives must be specific and measurable;
- training is essential and starts at the top;
- three- step process of planning, control and action is needed.

Unlike Deming, Juran did not suggest making a major cultural change to the organisation, but rather sought to work within the system in order to improve quality. Juran's programmes were designed to fit into the current business planning of an organisation with a minimal risk of rejection. He argues that employees at different levels of an organisation speak in their own "language" while Deming believes that statistics should be the common language (Flood, 1993; Evans and Lindsay, 2001).

Philip Crosby

Philip Crosby is famous for the concept of "do it right first time" (Bendell et al, 1995). Owen (2002) summarised Crosby's philosophy as "quality is free" and that goals of any system should be zero defects. His philosophy can be found in his four absolutes of quality management: quality is defined as conformance to requirements; quality is achieved by prevention rather than inspection; quality standard should be zero defects; the measurement of quality is the price of non-conformance. Crosby believes that higher quality reduced costs and increased profit; hence, he argued that it did not cost money to improve quality. He, therefore, advocated a goal of zero defect by coming up with the zero defect programme and continuous improvement to achieve quality (Crosby, 1979).

As Deming, Crosby is famous for his fourteen principles of continuous quality improvement through which a total quality culture could be developed (Zairi, 1991; Flood, 1993). Crosby has come up with his own programme for actions in his fourteen-step offer of a rather straightforward method (Crosby, 1979). Dale (2003) indicated that these 14 steps are:

1. management commitment; helping management to recognise that it must be personally committed to participating in a quality improvement programme
2. quality improvement teams; bringing together representatives of each department to form a team
3. quality measurement; determining the status of quality throughout the company
4. cost of quality evaluation; establishing the cost of quality to indicate where corrective action will be profitable for a company
5. quality awareness; sharing with employees the measurement of what non-quality is costing through training and communication
6. corrective action; bringing problems to light for all to see and resolve them on a regular basis
7. establish an ad hoc committee for the zero defects programme; after a year has gone by, a zero defects day will affirm management's commitment to the world "zero defects" and the thought that everyone should do things right the first time
8. supervisors train; a formal orientation of the zero defects programme with all levels of management should be conducted prior to its implementation
9. zero defect day; zero defects as the performance standard of the company is established in one day to provide emphasis and long lasting impression
10. goals-setting; regular meetings between supervisors and employees help people learn to think in terms of meeting goals and accomplishing specific tasks as a team
11. removal of task and error causes; individuals are asked to describe any problems that keep them from performing error-free work; the appropriate functional group will develop an answer to those problems
12. recognition; award programmes are established to recognise those who meet their goals or perform outstanding acts; awards should not be financial, recognition is what is important

13. quality councils; quality professional and team chairpersons should meet regularly to communicate and determine action to upgrade and improve the quality improvement programme
14. do it over again; setting up a new team of representatives and begin again to overcome the turnover and changing situations that occur in the year to 18 months to implement the typical quality improvement programme.

Armand V. Feigenbaum

Feigenbaum is a guru in TQM; his contribution is a whole approach, an approach to total quality control. He believes that there is a need to manage company-wide; co-ordinating and controlling all management and operational functions, bringing together social and technical aspects of the organisation. He suggests that all these are achieved at the same time as paying due respect to external satisfaction of consumers, as well as focusing on supplies and suppliers (Flood, 1993).

Dale (2003) mentioned that Feigenbaum identified 10 benchmarks necessary for total quality competitive success:

1. quality is a company-wide process
2. quality is what the customer says it is
3. quality and cost are sums, not a difference
4. quality requires both individual and teamwork
5. quality is a way of managing
6. quality and innovation are mutually dependent
7. quality is an ethic
8. quality requires continuous improvement
9. quality is the most cost-effective, least capital—intensive route to productivity
10. quality is implemented within a total system connected with customers and suppliers

Feigenbaum believes that management must commit themselves to strengthening the quality improvement process itself, making sure that quality improvement becomes a habit and managing quality and cost as complementary objectives (Dale, 2003).

Feigenbaum's philosophy can be summarised as a commitment to a systemic, 'total' approach and an emphasis on designing for quality and involving all departments are evident. Providing this is in recognition of, and depends on, the human aspects of the organisation. Statistical methods are used as necessary (Beckford 2002).

Kaoru Ishikawa

Kaoru Ishikawa is known as the "father of quality circles" for his role in launching Japan's quality movement in the 1960s (Bank, 2000). Ishikawa has developed quality control circles (QCCs) to help in implementing the philosophy of participation. The circles work in the following way: a small number of volunteer workers from a unit of an organisation form a group called a quality circle. The circle can be led by any person, be they supervisor or worker. The circles have regular meetings to discuss how their tasks can be implemented effectively and efficiently (Flood, 1993). In addition, Owen (2002) stated that Ishikawa's theories are based on the belief that quality improvement is a continuous process. He proposed a system of seven basic quality tools that can be used to provide this continuous improvement. The tools are to undergo special training. These basic seven tools are cause and effect diagrams flowcharts, pareto diagrams check sheets histograms, scatter diagrams and control charts.

Evans and Lindsay (2001) summarized key elements of Ishikawa's quality philosophy as:

1. quality begins and ends with education
2. the first step in quality is to know the requirements of customers
3. the ideal state of quality control occurs when inspection is no longer necessary
4. remove the root cause, not the symptoms
5. quality control is the responsibility of all workers and all divisions

6. do not confuse the means with the objectives
7. put quality first and set your sights on long-term profits
8. markets are the entrance and exit of quality
9. top management must not show anger when facts are presented by subordinates
10. ninety-five percent of problems in a company can be solved with simple tools for analysis and problem solving
11. data without dispersion information (i.e. variability) is false data.

Genichi Taguchi

Taguchi refused the classical approach to the design of experiments as being too impractical for industrial situations and revised these methods to form his own approach. He has been applying the Taguchi design of experiments in the Japanese electronics industry for over 30 years. His ideas fall into two principal and related areas known as 'the loss function' and 'off-line quality control'. He promotes three distinct stages of designing in quality: system design, parameter design and tolerance design (Dale, 2003). Owen (2002) adds that Taguchi's ideas place the emphasis of quality on the pre-production of products and services. His theory is that quality and reliability are the result of the design of services and products rather than inspection. In order to develop the products, Taguchi suggests eight stages: define the problem; determine the objective; conduct a brainstorming session; design the experiment; conduct the experiment; analyse the data; interpret the results; run a confirmatory experiment (Beckford, 2002).

Shigeo Shingo

Shigeo Shingo may not be as well known in the West as the Japanese gurus, although the impact of his work, particularly in Japan, has been immense. He started to develop Poka-Yoke systems in 1961. Poka-Yoke systems—literally meaning mistake proofing—use devices or work methods which prevent defects from occurring. Although it developed for manufacturing systems, Poka-Yoke has clear application in administrative, customer-service and other non-manufacturing systems. The main idea is

to stop the process whenever a defect occurs, define the cause and prevent the recurring source of the defect. Poka-Yoke devices, in effect, give 100 per cent inspection but, during the process, when detection is still possible and not after the event, when it is too late. By using Shingo's concept of zero quality control, zero defects can be achieved (Bendell et al, 1995).

3.5 Models of TQM implementation

Many nations have developed quality awards in order to promote an awareness of productivity and quality, foster information exchange, encourage organisations to adopt quality and productivity improvement strategies, recognise firms that have instituted successful strategies and provide role models for other businesses in the country (Evans and Lindsay, 2001).

It is pointed out by Tan (2002) that the awards are made annually to only the most worthy and well-run firms. They are a nation's highest accolade for achievement in the best quality management practices. The national quality awards vary in many ways including:

- different award categories for different organisational sizes
- awards for the manufacturing and service sectors
- awards for non-for profit organisations
- awards for different levels of quality management excellence attainment.

In general the awards are managed by government statutory bodies with the participation of judges and examiners from both public and private business organisations (Tan, 2002).

However, Vokurka et al. (2000) advised users that the use of models should not be considered a panacea to all problems. It is argued that the models underpinning the quality awards, like most models, have limitations (Ghobadian and Woo, 1996).

This section aims to discuss the business excellence models used by organisations in TQM implementation. Consideration is, therefore, given to the most common models, the Deming Prize (1951), Malcolm Baldrige National Quality Award (1987) and the European Quality Award (1988).

The Deming Prize

Although self-assessment is a new idea in the west, in Japan quality gained popularity when the Japanese Union of Scientists and Engineers (JUSE) was established in 1946. In 1950 JUSE invited Deming to deliver lectures and seminars and his work in statistical process control created a devotion to quality control that has become engrained in Japanese industrial culture (Kathawala and Elmuti, 1991).

JUSE then instituted the first and oldest quality award, the Deming Prize, in 1951 in his honour, for his contribution to improvising Japanese industry through his lectures on quality improvement, particularly his emphasis on statistical process control (Zairi, 1996). The nationwide acceptance of the Deming Prize resulted in massive improvements in manufacturing quality that put Japan on the world map (Kathawala and Elmuti, 1991).

The Deming Award is divided into two prizes which are awarded annually. The first, the Deming Application Prize, is awarded to organisations, divisions and small enterprises that have achieved distinctive performance improvement through the application of company wide quality control. The second, the Deming Prize, is for individuals. This is an award in recognition of outstanding contributions in the area of research and education (Evans and Lindsay, 2000).

Ghobadian and Woo (1996) indicated that the Deming Application Prize has a checklist containing ten primary factors:

1. policies

2. the organisation and its operations
3. education and dissemination
4. information gathering communication and its utilization
5. analysis
6. standardization
7. control/ management
8. quality assurance
9. effects
10. future plans

The organisations which apply for the prize are expected to forward 30 copies of a document that describes the corporate quality control practices and, if appropriate, the quality control practices of their business unit(s) and the business activities and organisation prospectus. The applicants' written submission is examined by the Deming Application Prize sub-committee. They establish whether quality control/management is practised systematically and effectively throughout the organisation. The companies which meet these requirements are visited for an on-site examination (Ghobadian and Woo, 1996).

The Deming Prize has gone through several changes since it was launched. As JUSE administers the award, applicants need to be approved by the organisation's consultants for them to go through the review process. This explains why it took a long time for Florida Power and Light, the first company outside Japan to win the award in 1989, to be accepted as an applicant. The assessment process is known to be extremely thorough (Porter and Tanner, 1996).

Malcolm Baldrige National Quality Award (MBNQA)

The growth of productivity of the American manufacturing sector slowed dramatically during the late 1970s and 1980s, while foreign competitors, particularly in Japan,

became increasingly competitive. One of the most remarkable features of the Japanese was the incredibly high quality of their products (Arvinder et al., 1997).

In the 1980s several industrial and government leaders saw that renewed stresses on quality was no longer an option for American organisations, but a necessity for doing business in an ever growing, and more demanding, competitive international market. However, various American businesses either did not believe that quality mattered for them or did not know where to start. Therefore, the Baldrige Award was created in 1987 by the United States Department of Commerce as a standard of excellence that would help US organisations achieve world- class quality (Kathawala and Elmuti, 1991).

The aim was to encourage organisations to commit to quality improvement and to improve productivity and their competitiveness. Thus, the award programme aimed to recognise US organisations for their achievements in quality and business performance and to raise awareness about the importance of quality and performance excellence as a competitive weapon (Zairi and Youssef, 1995).

The purposes of the award are summarized by Evans and Lindsay (2000) as follows.

- To help stimulate American companies to improve quality and productivity for the pride of recognition while obtaining a competitive edge through increased profits.
- To recognize the achievements of those companies that improve the quality of their goods and services and provide an example to others.
- To establish guidelines and criteria that can be used by business, industrial, governmental and other enterprises in evaluating their own quality improvement efforts.
- To provide specific guidance for other American enterprises that wish to learn how to manage for high quality by making available detailed information on

how winning enterprises were able to change their cultures and achieve eminence.

Particular goals of the award include promoting awareness of the relationship between quality and competitiveness, raising understanding about the level of quality required to achieve world class recognition, and fostering the sharing of information about quality by world class organisations (Bemowski, 1995). It could be concluded that one of the most frequent uses of the MBNQA criteria is for self assessment (Black and Porter, 1996).

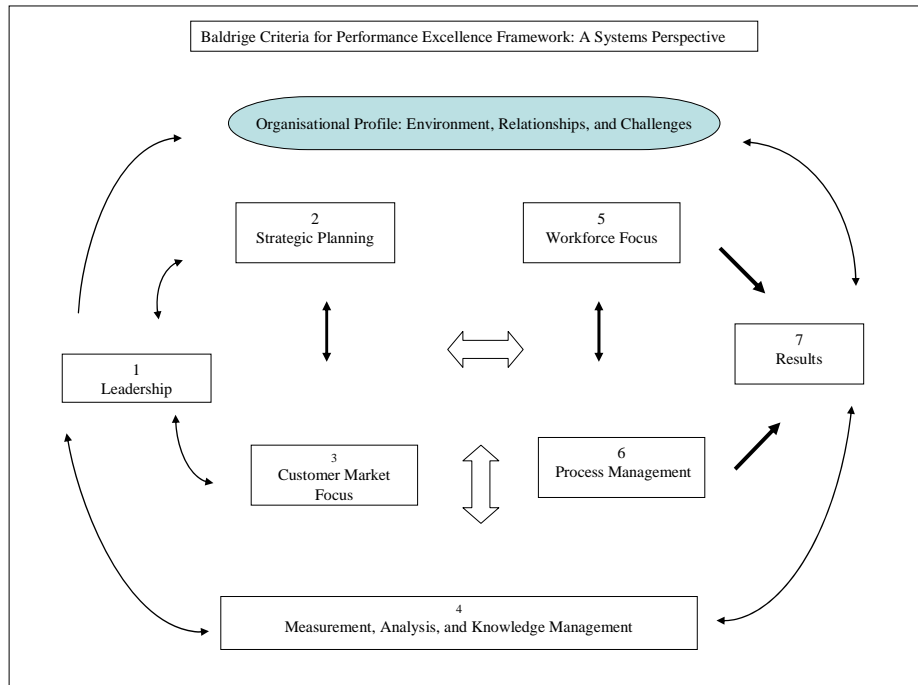
Evans and Lindsay (2001) indicated that the requirements of the criteria for performance excellence are embodied in seven categories, items and area to address. The seven categories are:

1. leadership examines senior executives' personal leadership and involvement in creating and sustaining values, company directions, performance expectations, customer focus and a leadership system that promotes performance excellence
2. strategic planning examines how the company sets strategic directions and how it determines key action plans
3. customer and market focus examines how the organisation determines the requirements and expectations of customers and markets
4. information and analysis examines the management and effectiveness of the use of data and information to support key company processes and the company performance management system
5. human resource focus examines how the workforce is enabled to develop and utilize its full potential, aligned with company objectives
6. process management examines the key aspects of process management, including customer-focused design, product and service delivery processes, supplier processes, and supplier and partnering processes involving all work units

7. Business results examines the company's performance and improvement in key business areas, and performance levels relative to competitors.

Figure 3.2 presents the Baldrige Reward Model.

Figuer 3.2 Baldrige Model



Source: NIST(2008)

Each category consists of several items that focus on major requirements on which the business should focus (Evans and Lindsay (2001). It is pointed out by Prybutok and Cutshall (2004) that these seven categories could fit into a framework composed of four basic elements: driver, system, measures of progress and goal.

The European Foundation for Quality Management Award (EFQM)

Following America's successful introduction of the Baldrige Award, Europe also realised the importance of self-assessment in monitoring and improving organisational

performance (Oakland, 2000). In 1991 the European Foundation for Quality Management (EFQM) in partnership with the European Commission and European Organisation for Quality announced the creation of the European Quality Award (EQA). The award was introduced to improve awareness throughout the European society, and business in particular, of the growing importance of quality to their competitiveness in the increasingly international market and to their standard of living (Evans and Lindsay 2001).

Ghobadian and Woo (1996) highlighted that the main purpose of the award is to support, encourage and recognize the development of effective total quality management by European organisations. Most western European nations and business sectors are represented among the members. They added that the vital objective of the EFQM is to improve the position of European industry and commerce by strengthening the strategic role of quality in corporation. This is because quality is perceived to be a significant contributor to superior competitiveness. Thus, EFQM has two declared missions:

- to accelerate the acceptance of “quality improvement” as strategy for attaining global competitive advantage
- to stimulate and assist the development of “quality improvement” activities on a wide front.

The European Quality Award consists of two parts: the European Quality Prize EQP and European Quality Award EQA. These are administrated by European Foundation for Quality Management EFQM in conjunction with the European Organisation for Quality EOQ (EFQM, 1999).

The award process is similar to the Deming Prize and Baldrige Award. The assessment is based on customer satisfaction, business results, processes, leadership, people satisfaction, resources, people management, policy and strategy, and impact on society. These are driven by enablers, the means by which an organisation approaches its

business responsibilities (Evans and Lindsay 2001). The initial assessment is conducted systematically and objectively for each application against the set criteria. In addition, the initial examination includes an assessment of the objectives of the company and the performance of its competitors (Ghobadian and Woo, 1996).

3.6. Quality management approaches

TQM implementation differs throughout the world. TQM is receiving international acceptance but not all organisations are willing to accept its fundamentals, nor do they make an effort to understand and apply it. Many organisations have considered using TQM in a fragmented form, not in its entirety; lack of management commitment has been advanced for this type of approach (Kristensen et al, 1995). The following discussion relates to compliance and the divergence of Japanese, US and European approaches.

TQM in Japan

Competition in the worldwide market was begun by the Japanese penetration into industries such as ship building, motor cycles and cameras (Dale and Plunkett, 1990). The major source the Japanese success was TQM implementation in all aspects of business. Comprehensive efforts were made to promote quality control in Japan in the 1940s through the establishment of the Japanese Union of Scientists and Engineers (Garvin, 1988; Lakhe and Mohanty, 1994; Fleury, 1995). The Japanese were the first to make use of the teaching of quality of the quality gurus such as Deming and Juran at the shop floor level when they started implementing the concept of statistical process techniques (Dale and Plunkett, 1990).

This effort resulted in the establishment of a statistical control technique and quality control education in Japanese organisations, but top management did not become directly involved in these quality control activities. It was only after the statistical quality control lectures delivered by Deming and Juran in the 1950s that top

management listened to, and started to support, the programmes of quality improvement (Lakhe and Mohanty, 1994; Earley and Erez, 1997).

Some significant considerations by the Japanese in implementing TQM have been found to be: top management direct involvement; emphasis on training and education; a formal organisation of quality; the use of informal quality control circles, giving awards, lots of patience (Lakhe and Mohanty, 1994; Earley and Erez, 1997).

It is claimed by Earley and Erez (1997) that the effectiveness of Japanese quality improvement programmes have helped in aligning quality strategies with their group-focused and high power-distance cultures, as in this culture, where direction and control were vested with top management. Also, the implementation of Japanese national quality policy by a top-down approach has enabled them to dominate the business world in economic terms.

Chase, (1988) indicated that Japanese companies display the following characteristics:

- management thinking driven by TQM
- employee involvement and commitment at all levels (down-up)
- total dedication to achieving customer satisfaction
- innovation as supplement process to TQM
- long-term planning.

There is no doubt that the Japanese culture helped in this transformation, but it is significant to recognise that the practice of managing quality as opposed to managing-in quality is old-fashioned and that the Japanese have achieved the ability to make quality an organisation-wide consideration at all stages of the enterprise (Earley and Erez, 1997).

TQM in the USA

The realization that quality management and quality control were central elements in Japan's economic success finally led American industries to focus on quality management and the statistical techniques proposed by Deming (1982) and Juran (1974).

Chase (1988) pointed out that American organisations that implement TQM have a different set of distinctive characteristics:

- flexibility of approach
- greater involvement by management (top-down)
- emphasis on individuality-allowing "high flyers" and entrepreneurial spirit
- greater visibility of mission statement and quality goals
- innovative flair

TQM in Europe

Germany, the UK, France and Italy are some of the European countries that have taken an important interest in TQM implementation. However, a study carried out by Zairi et al (1993) revealed that the West European approach to quality started off as uninspired and hesitant. Lascelles and Dele (1988) in the UK automotive industries, stated that organisations have a traditional attitude towards quality management. The changes in the European market have given the main impetus to the implementation of TQM. The focus seems to be changing to quality improvement process, quality-related training and consideration of the relationship of the organisation to the external world in pursuing quality. Although the industries had a traditional approach towards quality, the adoption of BS 5750 and ISO 9000 have given new impetus to the quality movement in those countries and is reflected by the top management commitment through better investment, rewards and treating everyone in the same way.

Based on the literature, there are some agreements and the disagreements between Japan, USA and Europe TQM approaches. Chase (1988) indicated that there were some common TQM threads that ran through both American and Japanese organisations:

- internal and external customer focus
- workforce involvement-usually through quality circles
- policy deployment processes that push the mission and goals through all levels of the organisation
- management of suppliers resulting in JIT, high stock turnover and certification of suppliers.

In Japan, first-line supervisors are more likely to identify more closely with workers than with management, although split loyalties can also be found (Nosow, 1981).

Many studies disclosed that most Japanese manufacturers pay great attention to control of processes, design and maintenance of equipment, housekeeping, product handling and other aspects of production that might affect quality, perhaps adversely. While, in the United States, manufacturers have directed less attention to these issues. Japanese organisations also place greater emphasis on workforce involvement and harmonious labour relations than do most American companies (Garvin1986).

Xiao and Proverbs (2002) concluded that Japanese contractors achieved significantly better quality performance than UK and US counterparts, with fewer defects on finished products, longer defects liability periods and fewer times called upon after completion. US and UK contractors do, however, seek more frequent feedback from their clients after project delivery. Contractors in the three countries achieve a similar level of client satisfaction from their respective quality performance. Table 3.4 is a comparison of consumer's perceptions of quality and approaches of businesses towards quality in different national setting.

Table 3.4 Consumer perceptions of and business approaches towards quality

Nation	Approaches of business towards quality			
	Customers' view about quality Quality determined by	Decision to buy product by	Quality promotion activity aims at	Emphasis for achieving quality
USA	1. Well known name 2. Word of mouth 3. Past experience	1. Price 2. Quality 3. Performance	1. use of statistical quality control 2. Administration of quality control system 3. Selling quality consciousness	1. Use of process simplification techniques 2. Customer satisfaction in strategic planning 3. Quality performance as criterion for compensating senior management
Japan	1. Well known name 2. Performance 3. Ease of use	1. Performance 2. Price 3. Ease of use	1. Motivating people 2. Improving skills 3. Providing better job	1. Incorporating customer expectations in design of products and services 2. Employee participation in regularly scheduled meeting about quality 3. Customer satisfaction in strategic planning 4. Process simplification and cycle time reduction
Europe	1. Price 2. Well known name	1. Price 2. Quality itself	1. Comprehensive quality improvement education 2. Use of measurement systems	1. Incorporating customer expectations in design of products and services 2. Past performance as criterion for compensating senior management
Developing nations	1. Price 2. Well known name 3. Appearance	1. Price 2. Appearance 3. Word of mouth	1. Inspection and measurement 2. Promoting brand name	1. Use of technologies to meet customer expectations 2. Use of process simplification and cycle time reduction

Source: Lakhe and Mohanty, 1994 p.17

3.7 ISO 9000

Building confidence between suppliers and manufacturers in business-to-business transactions and in international trade was the main aim of the ISO 9000 series (Van der Wiele et al.,) It is argued in the literature that most of the popular quality philosophies are based on ISO and TQM (Lee and Palmer; Heras et al., 2002). In addition, the literature mentions that TQM has become a key strategy for most of the manufacturing companies in developed countries and in developing countries (Salaheldin, 2003). Najmi and Kehoe (2000) highlighted that increased global competition for manufactured products has led to the international adoption of quality systems standards and, in particular, the ISO 9000 series.

The ISO 9000 series of quality system standards and their related certification have been in place for a considerable time. It is worth mentioning that it was developed from the

military standards and the British standard (BS 5750). The first global standard, agreed through the International Organisation for Sanitation (ISO), was published in 1987. However, the ISO carries out a regular revision of its standards in order to keep up with modern development and a radical revision of ISO 9000:1994 standard was published in 2000 (Van der Wiele et al., 2005).

The benefit of applying ISO 9000 standards stands on helping to ensure that companies follow particular well-documented procedures in the making and / or delivery of their products or services. These procedures could guarantee that the products or services of a company are in accordance with customer specifications. Therefore, it could be argued that they are aimed at the assurance of quality consistency rather than at improving a company products or service (Tsiotras and Gotzamani, 1996). There are a number of studies which suggest that internal factors were found to be the major motivational factors for implementing ISO 9000. Gotzamani and Tsiotras (2002) pointed out that the most significant certification motives stemmed from Greek companies' intention for real internal improvement.

Withers and Ebrahimpour (2000) reported that American organisations were greatly motivated to look for certification because of internal factors. It has been observed by Escanciano et al. (2001) that, in the Spanish organisations, improving quality in general and the company's operative quality, in particular, have been the most significant motives for ISO 9000 certification. However, they added that this clearly shows the change of mentality in Spanish organisations' management, which leads to an increasing awareness of the need to participate in total quality management. Gotzamani and Tsiotras (2002) highlighted the importance of ISO 9000 in internal organisational improvement. They state that:

“ISO 9000 standards really set a strong basis for companies' organisation sine improvement of internal organisation operation is proved to be the first and most important benefit (p.161)”.

Pan (2003) mentioned that the implementation of ISO 9000 could streamline the internal organisational procedures and operation. It is argued that customer satisfaction improvement could be achieved by implementing ISO 9000 standards (Gotzamani and Tsiotras 2002). Escanciano et al (2001) added that ISO 9000 implementation helps in improving the work environment.

In addition to the previously mentioned internal motives for ISO 9000 certification there are some external motives as well. Empirical research suggested that many companies are driven to seek certification by external motivational factors. For example, Jones et al (1997) found that maintaining or increasing market share is a motive for getting the ISO 9000. Carlsson and Carlsson (1996) stated that ISO 9000 certification could improve the organisation's reputation and image in the eye of customers. Furthermore, in order to increase the competitive advantage of organisations Escanciano et al. (2001) and Mathews et al., (2001) asserted that ISO 9000 is the essential first step on the path towards competitiveness and excellence. Sebastianelli and Tamimi (2003) argued that one strong indication of the continued relevance of quality management to organisations competing in the worldwide market is the recent revision of the ISO series of quality standards. Despite the international recognition and acceptance of the ISO 9000 series standards Singels et al (2001, p.62) stated that:

ISO 9000 certification gives no guarantee that the quality or service of an organisation is better than the quality of other organisations. Thus, ISO 9000 certified organisations do not automatically have a good product quality”.

Motwani et al (1996) have a concern about ISO 9000. They pointed out that registration is associated with high cost; they added that it does not concentrate on continuous improvement. This criticism is affirmed by Kartha (2004, p.335). He stated that:

“ISO 9000 does not emphasis on continuous improvement of defect prevention. In part, it was the deficiencies of ISO 9000 that led to the development of QS 9000 by the big three automobile manufactures in 1994”

In the developing countries registration to ISO 9000 was substantially lower than in the industrial countries. However, the quality standard has become a subject of interest in Jordan due to the fact that ISO 9000 has become extensively used throughout Europe, the USA and globally as a national and international accepted quality standard. Jordan began to implement ISO in different organisations in 1995 (cited in Al-Madi, 2005). The first Jordanian company received the ISO 9001 certification early in 1995 and by April 1996 six more companies had obtained it. Based on that achievement the early awareness of the importance of quality was realised and increased (Assbeihat, 2003).

The number of certified companies was low in the first three years but then it began to grow quickly. Based on the twelfth cycle of the annual survey of ISO 9000 in the world (ISO, 2002) until 1995, Jordan had only four organisations registered with ISO 9000 but by 2002, the number had reached 438. However, this number decreased to 147 by the end of 2003, of which 112 converted to ISO 9000:2000 version. This could give an indication that Jordanian companies had lost their interest in ISO 9000 implementation, an outcome either because of the level of the benefits they witnessed as a result of ISO 9000 implementation, or because they acquired the promotion that they had been wanting from ISO 9000. Despite the extremely growing rates of the registration with ISO 9001:2000, the total number of certificates remained low in Jordan compared with the United Arab Emirates (UAE) which had reached 892 registrations at the same time (cited in Al-Madi, 2005).

3.8 Critique of Total Quality Management

In spite of the existence of several success stories of TQM implementation and its benefits, the actual impact of TQM cannot be disregarded (Crosby, 1997; Juran, 1988; Ramberg, 1994; Hill and Wilkinson, 1995; Man and Kehoe, 1995).

It has been reported by Eskildson (1995) and Harari (1993) that there are a number of failures. For example, Eskildson (1995) argued that TQM does not provide a cure-all nor is it a single key to organisational success. He provides an example of what was the bankruptcy of the Wallace Company (one of the winners of the MBNA) after receiving an award. The literature disclosed that the failure of TQM implementation was more likely to result from an inability to understand and implement TQM rather than any inherent flaw in the concept (Evans, 1995; Zairi, 1994). Reimann and Hertz (1996) pointed out that an awareness of basic requirements of quality competitiveness does exist but levels of understandings are more likely to be poor. TQM can clarify this understanding of customer focus.

The gurus fail to draw on broader organisational issues such as strategic thinking and exercise of power rather than leadership and non-stop managerial renewal. The most readily discernible consequence of this is the shortage of a conceptual understanding on the part of managers as to what constitutes the vital organisational elements and requirements for successful TQM implementation (Nwabueze, 2001). Oakland (1989) argued that the fundamental message of the quality gurus is essentially the same.

Nwabueze (2001) added that Crosby has been criticised for his philosophical limitations. For example, Juran and Deming argued that it is pointless, if not hypocritical, to exhort a line worker to produce perfection (zero defects) since the overwhelming majority of imperfections are due to poorly designed manufacturing systems beyond the worker's control.

He indicated that there are the limitations of Deming's approaches. These limitations include:

“the action plan and methodological principles are too vague, implying that there is no clear Deming method. Deming failed to actually contextualise in an explicit holistic framework the implementation process of TQM. Hence, practising managers are faced with the difficulty of not knowing the “how, when and where” to start implementation his 14 points.”

Kordupleski et al., (1993) pointed out that TQM focuses mainly on internal matters such as performance measure, training, employee participation and leadership while they argued that the actual growth element comes from external matters (marketing). Consequently, quality programmes should incorporate the marketing side of quality, making customer' needs and perceptions meaningful internally. In addition, the key is to find ways to link external measures of customer' requirements, fulfilment and purchase behaviour to internal quality measures.

Leonard and McAdam (2003) asserted that the key points of the TQM application model disclosed that most of the companies initially began their TQM efforts at an operational level. Those which began at this level consequently found it not easy to move their efforts to a tactical or strategic level. Of those who initially began at the strategic and tactical levels, some used TQM to translate or implement strategy. Very few of the organisations initially started TQM at a strategic formulation level.

There are other criticisms that went with the models. Ghobadian and Woo (1996) stated that the Business Excellence Model (BEM) and other three major evaluative TQM award models such as the Baldrige, Deming and Australian are each based on models of TQM. These models are applied by using self-assessment-based evaluative frameworks. The models do not exclusively focus on product or service quality but consider a wide range of organisational activities. The models are very similar in scoring procedures; the method of evaluation is the main difference. Leonard and McAdam (2003) added that:

“the BEM and other similar quality models have beneficial applications in organisations. However, they do not adequately address the dynamic issues present within TQM applications in organisations. Furthermore, these dynamic issues, as manifest in strategic and operational applications of TQM, are not represented by models that primarily address operations and the implementation of strategy, as opposed to the formulation of strategy.”

Rees (1998) pointed out that there are diverse perspectives on QM from the prescriptive of the exploitation models. It is suggested by each perspective that TQM has diverse implications for shopfloor workers. Guest (1999) argued that there is a debate regarding the extent to which TQM should be automatically linked with high performance and high commitment HRM. He added that different sectors of industry could generate different results; for instance, the dynamic of TQM may differ within service sector environment, or those which employ a significant percentage of female employees.

It is argued by Glover (2000) that TQM often fails due to poor management rather than shopfloor intransigence. He added that it may have fallen from popularity prematurely and that a partial approach to TQM has meant that UK businesses failed to realise the full benefits from it.

Regardless of the numerical success of ISO, substantial doubts and criticism remain in relation to real benefits achieved by organisations applying the standard. Much of the criticism relates to the misapplication of the standard and the excessive promotion of the standard (McAdam and Jackson, 2002). It is concluded by Reimann and Hertz (1996) that the focus on ISO is conformance to practice rather than continuous improvement. This conclusion was also drawn by Kanji (1998). When he argued that continuous improvement and customer satisfaction are not explicit within ISO.

Despite the criticism and argument about TQM, it is argued that the quality movement has been the most significant of all management innovations in the last two decades (Krishman et al., 1993). Evans and Lindsay (2001) asserted that several companies achieved great success through total quality emphasis and, because the world is becoming more quality conscious, companies that resist TQM may not be in business for long. As the editor of Quality Digest put it, “TQM isn’t dead. TQM failure just proves that bad management is still alive and kicking” (Cited in Evans and Lindsay, 2001).

3.9 Chapter summary

This chapter presents an overview of the literature in TQM. It provides a thorough review of the essentials of TQM as perceived by the quality gurus and authors. It has included the concept of quality and TQM and arguments about its definitions, a brief history of TQM and its origin and transition from the concept of quality to total quality management. The most important TQM factors in the process of TQM implementation and associated issues are discussed in the next chapter.

Chapter Four

The Implementation of Quality Factors and Issues of TQM

4.1 Introduction

This chapter presents the most critical factors effecting TQM implementation, these are often stressed by researchers and supported by the writings of quality gurus. The factors that are included in this chapter are: top management commitment; employee empowerment and training; customer satisfaction; quality communications and structure; quality measurement and benchmarking; organisational culture; quality information systems; policy and strategic planning; suppliers relationship and continuous improvement. In addition, the researcher has highlighted the impediments to TQM implementation in general and has given special attention to those in developing countries in particular. The role of TQM implementation in achieving companies' competitiveness and the role of environmental factors and stakeholders in TQM implantation are presented.

4.2 Implementation factors

4.2.1 Top management commitment

Top management commitment is found by Sila and Ebrahimpour (2002) as a critical success factor for TQM implementation was among the issues that had the highest coverage in the literature (244 out of 347 surveyed). Salaheldin (2003) found that top management commitment to quality is the most important driving force that prompts TQM implementation in Egypt.

Virtually every article and book written about quality focuses on leadership (Evans, 2005). He added that "teach and institute leadership" is one of Deming's 14 points. Leadership is the first category in the Malcolm Baldrige National Quality Award and is

recognized as the “driver” of a successful quality system. Ahire and O’Shaughnessy (1998) indicated that the commitment of top management has been cited as one of the most important factors impacting the potential success of TQM in the organisation.

The success of a quality improvement programme or activity is based mostly on top management commitment or organisational commitment. It is not easy to influence the lower levels of an organisation, where much of the actual work is done, unless the top management is totally committed. Management commitment involves articulating a vision for the future that is clear and compelling and provides a strategic leadership (Tsang and Antony, 2001). Top management must establish a unity of purpose and direction. They must generate and maintain the internal environment in which employees can be fully involved in achieving the organisation’s purpose (Lewis et al., 2006).

Furthermore, Evans (2005) argued that there are three clear imperatives for managers who aspire to quality leadership. First, establish a vision: leaders are visionaries; they manage for future, not the past. Vision is crucial at every level during times of change. Leaders recognize the radical organisational changes taking place daily as opportunities to move closer to total quality. Second, living by the values: pursuing the quality vision commits the organisation to living by a set of values such as devotion to customers, continuous improvement and teamwork. Third, lead to continuous improvement: quality-oriented leaders must lead the continuous process improvement efforts that are the essence of total quality management. Sureshchandar et al. (2001p: 382) reported that:

“Top management commitment is the prerequisite for effective and successful TQM implementation. Visionary leadership pertains to the formulation of a long- range vision for the development of the organisation, propagating the vision throughout the organisation, devising and developing a plan of action and finally stimulating the entire organisation towards the accomplishment of the vision”

Dahlgaard et al., (1998) considered leadership as the beginning of the quality improvement process which starts with vision, mission, values, policy and strategy, systems, etc. and continues with other principles and concept of total quality management. He added that clear leadership and vision are considered to be the most significant critical success factors of TQM. Moreover, Deming (1982) and Juran and Gryna (1980) considered the degree of visibility in TQM implementation as a significant factor in the success of TQM adoption. *“Visionary leadership is core to the Deming management model and leadership is essential in order to create a service organisation that has both internal and external cooperation”* (Douglas and Fredendall, 2004, p.399). Oakland (2003) argued that there are five requirements for effective leadership:

1. develop and publish clear documented vision, corporate values, purpose and a mission statement
2. develop clear and effective strategies and supporting plans for achieving the mission
3. identify the critical success factors and critical processes
4. review the management structure
5. empowerment – encouraging effective employee participation.

Top management commitment is the only way to implement and maintain the culture necessary for TQM (Al-Khalifa and Aspinwall 2000). Abu-Hamattah et al (2003) indicated that leadership emphasises that the key roles of top management are setting values and general philosophy for the organisation, as well as designing the training plans, including the assessment and evaluation of the training requirements. Top management also emphasises adopting and implementing the “excellence” concept through ensuring financial, moral and personal support. Leaders of companies which are successful at implementing TQM may have the ability to articulate a compelling vision of the benefits of continuous quality improvement, employee fulfilment and customer satisfaction which are expected to accrue from TQM (Shea and Howell, 1998). Moreover, Hradesky (1995) expressed a concern about allocating adequate resources and time for quality management effort. He emphasised the integration of the major

companies' activities under the TQM umbrella with appropriate devotion of both time and resources and the need for top management participation and performance for more adoption.

Leadership must translate its commitment into a number of actions. These actions should be aimed at underpinning the skill to: compile and effectively analyse relevant information external to the firm (customer focus, benchmarking, and supplier quality management); collect and make a better use of quality related information inside the firm (SPC, design quality management, and internal quality information usage); ensure better application of quality information by employees (employee empowerment, employee involvement and employee training). Sanjay et al., (1998) and James (1996) referred to leadership continuum style as:

- 1- leader makes decision and announces it
- 2- leader sells decision
- 3- leader present ideas and invites questions
- 4- leader presents tentative decision – subject to change
- 5- leader presents problem , gets suggestions on solution and makes decision
- 6- leader defines limits and asks group to make decision
- 7- leader permits subordinates to function within limits as defined by the leader.

Within a “*total quality organisation*” the responsibility of leadership is one of understanding processes and variation, having a sense of the customer, understanding human psychology and having respect for people in the organisation (Deming, 1982).

“Getting quality results is not a short-term, instant-pudding way to improve competitiveness; implementing total quality management requires hands-on, continuous leadership” (Feigenbaum, 1989).

Evans and Lindsay (2001) describe leaders as the role models for the whole company. They must be passionate about quality and actively live the values. In addition, they

present the following leadership practices as being important in promoting quality and high levels of performance:

1. the creation of a strategic vision and clear quality values that serve as a basis for all business decisions at all levels for the organisation
2. setting high expectations
3. demonstrating substantial personal commitment and involvement in quality
4. integrating quality values into daily leadership and management
5. sustaining an environment for quality excellence.

4.2.2 Employee empowerment

Employee empowerment has been used as an effective strategy by companies like Toyota and Ford (Ahire et al., 1996). Empowerment is generally used to refer to a form of employee involvement initiative, widespread since the 1980s, and focused on task-based involvement and attitudinal change (Wilkinson, 1998). Deming (1986) emphasised the importance of empowering employees by giving them the authority and autonomy to do their jobs.

Employee empowerment provides a solution to the age-old problem of ‘tailorised’ and bureaucratic workplaces where creativity is stifled and workers become alienated, demonstrating their discontent through individual or collective means. Furthermore, employee empowerment can unleash the potential of individuals, or groups, of low status for taking over task-centred elements of managerial responsibilities (Wilkinson, 1998). TQM practices motivate organisation members’ participation, promote empowerment, recognize that employees play an important role in achieving the organisation’ goals and treat employees as primary resources (Karia, 2006).

Employee empowerment is that in which individual employees and groups in the company are encouraged and persuaded to create ideas for improving quality and are given the decision-making authority to apply these notions. The empowerment tool of TQM essentially focuses on how much decision-making authority to delegate to corporate subordinates by managers (Osuagwu, 2002). Ross (1999) indicates that the greater employee autonomy and discretion implied by team working is invariably accompanied by an intensification of work and increased self-monitoring. Hill and Wilkinson (1995) point out that continuous improvement involved in a process to satisfy an internal customer introduces elements of “bottom up” issue identification and problem solving which contrast with traditional “top down” management. When issues require information gathering or change elsewhere in the quality chain, then quality improvement has a horizontal dimension that enhances the future scope of a job at any given level in the company. They add that these facts of TQM have raised the possibility that TQM empowers organisation members by delegating functions that were previously the preserve of a more senior organisation member.

In order to encourage employee commitment and involvement, successful organisations put great importance on empowering their employees. It is suggested that the positive effects of employee empowerment are well documented but the idea has been challenged by some writers claiming that it is not possible to empower organisation members – rather, it is possible only to generate an atmosphere and a structure in which organisation members will take responsibility (Oakland, 2003).

Tsang and Antony (2001) indicated that organisations should use all employees’ skills and abilities, and organisation members in different departments should work as a team in any problem-solving initiatives. Employees must be recognised for their contribution and should feel that they are part of the organisation. Commitment, recognition and appreciation are necessary for employees in order to motivate them to achieve the set

aims. They asserted that employees should be encouraged to control, manage and improve the processes that are within their responsibility.

Wilkinson (1998) pointed out that TQM leads to employee empowerment and supports an organisation's efforts towards quality improvement. Dimitriades (2000) added that organisational members are given partial decision-making authority and responsibility, being encouraged to take part and contribute to continuous improvement by suggesting new methods of improvement to organisation management, such as the quality of products, processes, procedures and customer service.

Motwani (2001) argued that specific measures of employee empowerment should include: the extent to which cross-departmental and work teams are used; the degree of employee autonomy in decision making; the degree of employee interaction with customers; the degree to which employee suggestion systems are being used.

4.2.3 Employee training

Training is the basic practice that companies use in order to improve specific skills in employees that are necessary for carrying out the principles of quality (Tsang and Antony, 2001). Training and education have become very important responsibilities of HRM departments in TQ companies, particularly as empowered organisation members require new knowledge and skills, which should not have to be cost-justified (Evans and Lindsay, 2002). Oakland (2003) mentioned that the training and development of people at work has increasingly become recognised as a significant part of human resource management through the 1980s. Major changes in many organisations took place as a result of the introduction of new technology and wider ranges of tasks, all of which require necessary training provision. Kanji and Asher (1996) indicated that education and training are key factors in total quality management, including the process of learning TQM methods. If teams begin to look at quality management problems without suitable training they will lose their way and become disheartened.

Pioneers in quality, such as Deming, Juran and Crosby, actively promoted quality training and education. Two of Deming's 14 points, for example, are devoted to these issues (Evans and Lindsay, 2002). Feigenbaum (1961) asserted that training is significant to ensure that the skills of the labour force do not become obsolete in a changing environment and that it develops and maintains an understanding of the importance of quality. Ishikawa (1985) added that quality begins and ends with training. Crosby (1979) considered education of the labour force as being the core to developing awareness and understanding the new quality philosophy.

Dale (2003) argued that employees, at all level of an organisation, should be supported with the right level and standard of education and training to assure their general awareness and understanding of quality management concepts. Skills, competencies and attitudes are appropriate and suited to the continuous improvement philosophy; they also provide a common language throughout the business. A formal programme of education and training needs to be planned and provided on a timely and regular basis to empower organisation members to overcome increasingly complex problems. Dale (2003) added that, without training, it is difficult to solve problems and, without education, behaviour and attitude change will not take place.

Training for quality may include programmes dealing with elements of process improvement, such as team skills, communication, interpersonal relations and team-building training. Process analysis programmes can include measurement systems and data analysis. In addition, training programmes can cover problem-solving techniques, SPC, benchmarking, customer care, TQM implementation, quality costs and design for manufacturing (Curry and Kadasah, 2002). Organisation members must be oriented to their organisation's philosophy of commitment to long-term improvement, be informed of organisation objectives and be enabled to behave as a team. Suitable training includes an explanation of the overall operations of the organisation and product quality

specifications. Where SPC is practiced, it must include training in statistical methods. Particular measures for evaluating training must include: the time and money spent by organisations in training organisation members; management in quality principles and problem-solving skills; teamwork (Motwani 2001).

According to Tsang and Antony (2001), once the quality management system has been established, proper training should be provided to employees at all levels to assure that they understand the quality management system and their roles and responsibilities within it. Training is also important to improve the organisation member's confidence and, hence, to improve their personal development. Mathews et al. (2001) concluded that top managers and shopfloor employees receive more training in the areas of soft quality tools, quality awareness and customer focuses than in statistical approaches.

4.2.4 Organisational Culture

Hofstede is a famous researcher in the field of organisational culture. He defines culture as *“the collective programming of mind, which distinguishes the members of one group or category of people from another”* (Hofstede, 1991, p5). Hofstede indicated that organizational culture comes from national culture; cultures manifest themselves, from external to deep, in leaders, values and symbols (Hofstede, 1980). Furthermore, the differences in national cultures are reflected in how organisations are structured and managed (Chen, 2001; Hofstede, 1991).

James (1996) mentioned that culture is defined in different ways, a set of similar behaviours and ideas that set one group apart from another. The culture of a group, department or organisation can assist or inhibit change. Consequently, managing change effectively is a very common element in managing quality in an organisation.

Organisational culture is defined as *“all the interactions, which take place between people, their relationships, and the feeling engendered by their behaviour”* (Jeffries et al. 1996, p.78). Oakland (2003) defined the culture of an organisation as the attitude and

beliefs that pass through the organisation about how business should be conducted and how employees should act and be treated. Brown and Van der Wiele (1995) defined organisational culture as the model of beliefs, values and learned ways of overcoming with experience that has developed during the course of the history of the organisation and which tend to be manifested in its material arrangements and in the behaviour of its members.

Hofstede (1980, 1991, 2001) developed five dimensions in the national culture: power distance index (PDI); uncertainty avoidance index (UAI); individualism (IDV); masculinity (MAS); long-term orientation (LTO). The following paragraphs give a brief explanation of each dimension.

Power Distance (PD)- measuring the degree of inequality in society: this dimension shows how diverse communities treat inequalities in social structure. Hofstede argued that high PD nations are more likely to be centralised in political and leadership power with hierarchies in organisations and wide differences in salary and work position or status; this is clearer also in management styles. Managers have a high influence on their subordinates. On the other hand, in low PD cultures the subordinates and supervisors work closer together and more interchangeably, with flatter hierarchies in organisations and less difference in salaries and status (Hofstede, 1980).

Lee *et al.* (2000) argued that employees' relationships with authorities are shaped by their attitudes and beliefs about the appropriate power-distance between authorities and subordinates. Therefore, employees high in power distance pay closer attention to the fairness of procedures because they do not expect to, or are unable to, build strong relations with decision makers.

Individualism vs. Collectivism- individualist societies focus on the individual him/herself and there are no ties between individuals, consequently personal freedom is respected and valued, and personal decision-making is encouraged. On the other hand, in

collectivist cultures there is more focus on religion, custom and tradition; consensus is very significant and there is strong relationship between the individuals and between individual and groups. Therefore society is tied with strong relationships, the following of societal norms is valued, and group decision-making is encouraged (Stengers et al, 2005). According to Moorhead and Griffin (2004), people in individualist cultures refer to themselves as singular individuals rather than as part of groups or organisations. People in collectivist cultures refer to themselves as part of the groups or organisations where they belong. Table (1) shows the differences between individualism and collectivism, based on Hofstede's study (1980 and 1991).

Table (4.1) Differences between individualism and collectivism

Individualism	Collectivism
Everyone grows up to look after him/herself and his/her immediate family only	People are born into extended families or other in groups which continue to protect them in exchange for loyalty
Identity is based on the individual	Identity is based on the social network to which one belongs
Low-context communication	High-context communication
Employee-employer relationship is a contract supposed to be based on mutual advantage	Employee-employer relationship is received in moral term, like a family link
Management is management of individuals	Management is management of groups

Source: Kang and Araujo (2006).

Masculinity vs. Femininity (MAS)- the degree to which gender roles are defined. This dimension explains the extent to which the dominant values in society are 'masculine', that is, assertiveness, the acquisition of money and things, and not caring for others, life quality, or people (Hofstede, 1980). Masculinity refers to the extent to which "the dominant values in a society emphasize aggressiveness and the acquisition of money and material goods rather than concern for people, relationships among people, and the overall quality of life" (Moorhead and Griffin, 2004: 65).

Uncertainty Avoidance (UA)-this dimension explains the extent to which a member of a culture worries about unpredictable situations and the extent to which societies can tolerate uncertainty and ambiguity differs among cultures. Some cultures are high on the avoidance of uncertainty, value security and low-risk situations, while other cultures score low and have a greater tolerance for ambiguity and risky situations (Hofstede, 1980). Marzoq and Mohammad (2003) concluded that uncertainty avoidance might be seen as a cultural difference between western and Arab countries (including Jordan).

Long-term Orientation (LTO)- this dimension explains how different cultures exhibit either a future-oriented perspective or a short-term point of view. The consequences of a high score on the long-term orientation (LTO) index are persistence, thrift and the ordering and maintenance of relationships by status (Hofstede, 2001).

Hofstede dealt with Arab nations as one region when he conducted his extensive study to explore cultural dimensions. Hofstede in his findings (1997) characterized the Arab business culture by high power distance, high uncertainty and collectivism and these reflect the current situation in Jordan. Furthermore, many authors (such as Ali and Sabri 2001) stated that Arab management practices are a combination of four main characteristics: hierarchical authority; rules and policy; delegation of personality; power of individuals.

The relationships of family and friends are very significant sources of power in Jordanian society, as they are in all Arab countries (Hofstede, 1991). Hofstede (2001) highlighted the main cultural differences between the United States, India and the Arab countries (Jordan and Kuwait). For instance, the main differences are in individualism, uncertainty avoidance and power distance which affect the nature of the relationship between people and the organisations to which they belong. Specifically, in India and the Arab countries there is a greater emotional dependence of employees on their organisations where managers are seen as superior persons and those employees often

look for rules and procedures that make events in organisations clear and predictable. This may explain the nature of the relationship between formalisation and perceptions of procedural justice in India, Kuwait and Jordan.

Like Hofstede's findings, regarding the dimensions of culture, Trompenaars (1993) provided additional insights into cultural differences. Trompenaars concluded that cultures also differed on universalism versus particularism, neutral versus affective and achievement versus ascription dimensions.

Universalism versus particularism. Universalism is the extent to which people believe that different ideas and practices can be valuable in all situations. People who are high in universalism believe they can develop rules and standards that can be reasonably applied to everyone whatever the situation. They are more likely to use contracts formal systems and procedures to convey what they expect from others.

Affective versus neutral. People in highly affective cultures are more likely to express their feelings openly. In highly neutral cultures, emotions are not supposed to be expressed openly and naturally. People from highly affective cultures tend to smile, talk loudly when excited and greet each other enthusiastically. On the other hand, people from highly neutral cultures experience the same emotions, but are less inclined to express them, and they express them more subtly.

Achievement versus ascription. Social status is largely derived from a person's achievements in highly achievement-oriented cultures while, in highly ascription-oriented cultures, social status is largely derived from personal attributes such as age, experience, social connections, or gender. In organizations a person's status is reflected in his or her privileges, such as access to resources and perks, deferential treatment and input in decision.

An effort has been made by Johnston and Johal (1999) to capture the cultural composition of the online community using Hofstede's dimensions. In this analysis, when online, individuals from whatever country are held to adhere to a culture that is common to the virtual cultural area. In other words, there is a different culture of the internet that individuals' "possess" online; one that transcends the geographic-nationhood notion of culture. This culture of the virtual "country" is one of low power distance, low uncertainty avoidance, mixed individualism-collectivism, and mixed masculinity-femininity. Following this analysis, organisations have to adapt their strategies treating the internet and web as a distinct environment from the physical one (Johnston and Johal, 1999).

As well as discussions of the general Arabic culture it is possible to look more closely at the general culture within the ICT sector in Jordan. It is possible to use existing models to describe and analyse the general culture that exists within Jordanian ICT companies. For example Johnson and Scholes (1997) described the Cultural Web, a commonly used model, as a useful tool for viewing organisational culture from six perspectives:

1. stories and myths
2. symbols
3. power structure
4. organisational structure
5. control structure
6. rituals.

ICT is a young sector in the Jordanian economy. Stories are few but those that do exist concern the success of Jordanian companies within the Middle East and general Arab world. They discuss the dynamic nature of Jordanian companies since they were deregulated in the year 2000 and business success (World Bank Indicators, 2005).

Symbols that are associated with the sector and represent this success are the large office buildings with modern architecture. The buildings are a hub of activity and in themselves represent business success (Jordan Telecom Report, 2006).

The structure within the organisations takes different forms. In some there is a strong family hierarchy in place, in others, usually those that are overseas franchises; the structure follows a western model, in others, where there is a significant element of government involvement some areas of control are outside the fabric of the core organisation (Jordan Telecom Report, 2006; TRC, 2007).

With many of the organisations being newly founded the power within them closely reflects the type of organisational structure. The head of a family-owned organisation holds the power whilst in the franchise companies the power is often shared with people from external organisations. In the organisation that have significant government support the real power lies outside the organisation. Internal power is often held by those who interact with government representatives (TRC, 2007).

The day-to-day control structure within the sector is heavily dependent upon IT systems, processes and procedures. In all organisations there is hands-on control at the higher levels of activity (TRC, 2007).

Generally, Jordanian organisations are very bureaucratic in nature (Sabri, 2007; AL-Shaikh, 2003). However, the ICT sector breaks with this tradition. It is actively promoting an ethos of dynamic behaviour, being responsive, agile and adaptable to change.

This general view describes a newly developing culture that is forming its structure upon existing success and a recognised need to improve to take advantage of new opportunities. The people working in the sector are at the very forefront of Jordanian economic development.

Wasta is considered as exclusive phenomena in the Arabic culture in general and in Jordanian companies in particular. Wasta is a special type of illegal facility (English: means, mechanism, medium) and sometimes it is even given the nickname Vitamin Waw (as it gives power and so). “Wasta”, relates to someone in a powerful position doing something (legal or illegal) for a favour to someone that could not be done without a “wasta” (Bayazidi, 2005).

Wasta implies using those connections for personal gains and benefits and commonly stands for corruption (Hutchings and Weir, 2006; Whiteoak *et al.*, 2006). In organisations, Wasta is used to gain undeserved benefits, such as career, promotion, and advancement in work which is unattainable on the basis of merits and actual performance. The employees who depend on Wasta make use of their personal contacts with important people in the society (i.e. Ministers, Members of Parliament) to have special help that may not be available to others who are competing for the same job or promotion in the same organisations where they work. It is a major problem in the governmental organisations in Arab countries (Al-Tahat, 2005).

Rad (2006, p.619), in his study, found that the perfect organisation culture is essential for the successful implementation of TQM, when he said that:

“Organisational culture has a significant effect on the successful TQM implementation. For TQM programmes to succeed, a collaborative and corporate organisational culture supported by the long-term management and employees commitment and involvement, organisational learning, innovation and entrepreneurship, team working and collaboration, open communication, risk taking, continuous improvement, customer focus (internal and external), partnership with suppliers, and monitoring and evaluation of quality should be developed”.

TQM is a description of the culture, attitude and organisation of a company that aims to provide its customers with products and services that satisfy their needs. The culture requires quality in all aspects of the organisation’s operations, with things not being

right the first time, and defects and waste eradicated from operations (Guangming et al., 2000). Organisations need to develop a perfect implementation approach which is accepted by the culture. They indicate that culture plays a core role in the success or failure of TQM implementation. Therefore, it is important to develop TQM programmes that are accepted culturally. TQM programmes are more likely to succeed if the prevailing organisational culture is compatible with the values and essential assumptions suggested by the TQM discipline (Kujala and Lillrank, 2004).

Najmi and Kehoe (2000) pointed out that organisation members may refuse to go along with any new changes, but this problem can be solved by generating a quality culture in the organisation. Tsang and Antony (2001) indicated that organisations have to generate a culture where all the organisation members should participate in quality awareness programmes and quality improvement projects relevant to their own place of work. This culture is to change an individual's behaviour and attitude in different ways:

- each individual should be involved in quality improvement projects.
- employees must do their own inspection at work.
- absolutely no defective part, good or service can be passed on to the next process.
- each person must be committed to satisfying his/her customers, both internal and external.
- external suppliers and customers must be integrated into the improvement process.
- mistakes must be viewed as an opportunity for improvement.
- honesty, sincerity and care must be an integral part of daily business life.

Temtime and Solomon (2002) pointed out that changes of attitudes, value systems and beliefs are required in order to instill culture. They added that culture is considered as the glue which binds the activities and efforts of people in the workplace. TQM is an

educational process aiming at changing the behaviour and attitudes of organisational members and then developing a quality sensitive organisation culture. An open culture is required to progress the communication from top-to-bottom, bottom-to-top and across the departments, which enables the organisation members to share the information (Antony et al., 2002). Gotzamani and Tsiotras (2002) concluded that a change of culture was found to be the first most common barrier to TQM implementation, while it is also considered one of the main determinants for the success of any programme.

Williams et al. (1993) stated that culture influences what the managerial group attends to, how it explains the information and the responses it makes to change in the external environment. Culture is a significant provider to strategy analysis and the development of strategy. Because culture influences what other organisation workers attend to, how they explain this information and react, it is a significant determinant of the success of strategic implementation culture which influences on the organisation's ability to conceive and implement a latest strategy.

Prajogo and McDermott (2005) highlighted the relationship between TQM practices and organisational culture. They mentioned that a review of the literature suggests that there is a substantial disagreement on the nature of these relationships. One group argues that TQM practices bring cultural change and the other that it is organisational culture that effects TQM implementation and its results. In other words, the nature of this argument is concerned with the causal relationship between TQM and organisation culture, and which one is the antecedent of the other.

Berces and Hegyi (2001) identified some elements of a TQM programme that can be affected by the organisation culture:

- intra-and-inter organisational cooperation (relationships with internal and external customers and suppliers);

- use of statistical analysis tools in managing processes and operations (e.g. the measurement of rework costs, material waste);
- providing support and encouragement for continuous improvement (e.g. training);
- good record keeping and documentation (e.g. QA).

James (1996) indicated that there are three possible forms of problems with change:

- 1- the change process itself: the way change is managed
- 2- the change results: post-cultural requirements and changes in expected behaviours
- 3- the prechange culture: behaviours that resist the change process or change the outcome.

4.2.5 Quality measurement and benchmarking

Quality measurement and benchmarking are considered as a significant TQM factor (Motwani, 2001). He pointed out that organisations must embrace strong acceptance and maintenance of total quality measurement and benchmarking plans. Most authors endorse a “zero defect” and a “do it right the first time” attitude towards the quality programme. Quality programmes should measure the percentage or the number of parts that deviate from the acceptable in order to avoid the recurrence of a defect. Measurement techniques should also include monitoring supplier quality levels. Utilizing statistical process control reduces process variability and calculates the cost of quality (Ahire et al., 1996). Motwani (2001) pointed out that the cost of quality could include relevant changes in market share, warranty costs and inspection, reworks, and scrap costs. The cost of nonconforming raw materials and processed parts could include lost revenue or productivity cost and would aid in vendor selection and certification.

The implementation and continued use of SPC enables managers to model and analyse the performance of key processes. The knowledge gained enables them to intervene, making cost effective changes to processes to thereby improving performance and

overall reliability. The use of SPC is as appropriate in the service sector as it is in the manufacturing sector. Garvin (1988) and Evens and Lindsay (1996) all refer to issues of manufactured product and service reliability being of key importance to customers' perceptions of quality. The human element engaged in process delivery is a key variable important to reliable service delivery. Training and providing opportunities for gaining experience are significant actions that managers can take to measure the impact of using SPC for process improvement.

However, there are some differences between the benchmarking process and performance evaluation. Performance evaluation is considered as a tool used for measuring productivity, cost efficiency and operational advantages which have traditionally been realized on a historical basis. The benchmarking process is usually based on a competitive basis and is the value of some parameters used as a reference point in comparison. It could be used to compare performance within one corporation (internal) or among different companies in an industry (external) (Chen, 2002).

4.2.5.1 Statistical process control (SPC)

Statistical process control (SPC) can be traced to the work of Walter Shewhart at the Bell Laboratories in the United States during the 1920s (Evans and Lindsay, 2001). SPC is a methodology used for signalling the need to take corrective action when it is appropriate and a controlling process to identify special causes of variation. As such, it provides a rational basis for implementing statistical thinking to monitoring processes. Basically, statistical control means that both the process average and variance are constant over time (Evans, 2005).

Process control is elementary and SPC formulates a vital part of the TQM strategy. It is necessary for organisations in the early stages of quality efforts. Incapable and inconsistent processes render the best design impotent and make supplier quality

assurance irrelevant. Whatever process is being operated, it must be reliable and consistent (Oakland, 2003).

SPC is a proven technique for improving quality and productivity. Many customers require their suppliers to provide evidence of statistical process control. Thus, SPC provides a means by which a company may demonstrate its quality capability, an activity necessary for survival in today's highly competitive markets (Evans, 2005). In the implementation of SPC there is often a focus on techniques more than on the implied wider managerial strategies. It is worth repeating that SPC is not only about plotting charts on the walls of a plant or office, it has become part of the company-wide adoption of TQM and is considered as the focal point of never-ending improvement. Changing an organisation's environment into one in which SPC can operate properly may take many years rather than months. For many organisations SPC will bring a new approach, a new philosophy, but the importance of the statistical techniques should not be disguised. Using diagrams, graphs and charts to present the data should become the means of communication concerning the state of control of processes. It is on this understanding that improvements will be based (Oakland, 2003).

4.2.5.2 Six Sigma

"Six Sigma has been sweeping the business world with remarkable results over the last 20 years or so" (Antony, 2008 p, 107). Six sigma is described as a business improvement approach that seeks to find and remove causes of defects and errors in manufacturing and service processes which can be achieved by focusing on outputs that are critical to customers and a clear financial return for the companies (Evans, 2005). Antony (2004) concluded that six sigma is considered as a powerful business strategy that has been recognised as imperative for achieving and sustaining operational and service excellence.

Oakland (2003) indicated that six sigma organisations focus on: understanding their customers' requirements; identifying and focusing on core-critical processes that add value to customers; driving continuous improvement by involving all employees; being very responsive to change; basing managing on factual data and appropriate metrics; obtaining outstanding results, both internally and externally. Pfeifer et al (2004) revealed that six sigma provides several methods and tools from two fields:

1. statistics (such as methods of statistical analysis or the tools of design of experiments)
2. quality management (i.e. for ensuring customer orientation in the product development and failure prevention).

Antony (2007) asserted that the six sigma strategy has four aspects that are not accentuated in other quality management and improvement methodologies of the past. The first characteristic of six sigma is that it focuses on achieving bottom-line results in monetary terms. Secondly, six sigma has been very successful in integrating the human (teamwork, culture change, motivation, customer focus etc) and process (process control, process monitoring, process analysis, process improvement, etc.) aspects of improvement. The third key characteristic of six sigma is that it integrates both statistical and non-statistical tools of quality improvement in a sequential manner within a powerful problem-solving framework. The fourth characteristic of six sigma is that it generates a powerful team infrastructure (project champions, master black belts, black belts, green belts and yellow belts) for the implementation of projects. Evans, (2005, p: 84) stated that:

“The origin of the term six sigma is a statistical measure that equates to 3.4 or fewer errors or defects per million opportunities. Six sigma relates to the broader philosophy and improvement approach. An ultimate “stretch” goal of all organisations that adopt a six sigma philosophy is to have all critical processes, regardless of functional area, at a six sigma level of capability”.

Evans (2005) stated that there are four key issues to measure the performance in applying six sigma to services which require examination:

1. accuracy, as measured by correct financial figures, completeness of information, or freedom from data errors;
2. cycle time, which is a measure of how long it takes to do something, such as pay an invoice;
3. cost, which is the internal cost of process activities;
4. customer satisfaction, which is typically the primary measure of success.

As pointed out by Antony (2006), several benefits will be achieved for service-oriented companies by adopting six sigma:

- effective management decisions due to reliance on data and facts instead of gut-feelings and hunches
- increased understanding of customer needs and expectations, especially the critical-to-quality service performance characteristics which will have the greatest impact on customer satisfaction and loyalty
- efficient and reliable internal operations, leading to greater market share and satisfied shareholders
- improved knowledge across the organisation of various tools and techniques for problem solving, leading to greater job satisfaction for employees
- reduced number of non-value added operations through systematic elimination, leading to faster delivery of service

- reduced variability in service performance, leading to more predictable and consistent level of service
- transformation of organisational culture from being reactive to proactive thinking or mindset
- improved cross-functional teamwork across the entire organisation.

He added that (2008, p.107) *“Organisations that implemented Six Sigma have benefited from it in three major ways: reduced defect rate; reduced operational costs; increased value for both customers and shareholders”*.

4.2.5.3 Cost of quality

Quality costing is considered as a measurement of an organisation's performance with regard to the process of producing products and delivering services. The value to an organisation of conducting a quality cost analysis is to focus on its processes and their measurement and non-value adding activity to highlight waste in terms of a monetary unit of analysis and pinpointing potential improvements (Roden and Dale, 2000). The cost of quality is considered by many researchers as a core element in TQM; for example, Dahlgaard et al (1998) defined quality as continuously satisfying customers' expectations, and defined total quality as the process of achieving quality at low cost and TQM as “Total quality management is to achieve total quality through everybody's participation”.

Oakland (2003) described quality cost as a significant management tool. He indicated that quality cost provides an organisation with a method to assess the effectiveness of the quality management and a means of determining problem areas, opportunities, savings and action priorities. Implementing a cost of quality systems creates five basic advantages for organisations. It helps in accepting quality data more readily because they are gathered and analysed by the accounting department in a team environment. It

also helps in the evaluation of capital investment alternatives. The cost of a quality system helps to justify and steer investments in prevention activities, which lowers quality costs. Furthermore, it helps justify and steer other quality improvement efforts and investments. It leads to the development of a more advanced performance measure in the areas of customer satisfaction, production and design to better target indirect quality costs and return on investment and sales are improved while reducing costs (cited in Roden and Dale, 2000 to Bottorff 1997).

Feigenbaum categorized quality costs into prevention-appraisal-failure (PAF). PAF model has been almost universally accepted for quality costing (Tsai, 1998). Oakland (2003) described these costs.

- **Prevention costs:** these costs are associated with the design, implementation and maintenance of the quality management system. Prevention costs are planned and are incurred before actual operation.
- **Appraisal costs:** these costs are associated with the supplier's and customer's evaluation of purchased materials, processes, intermediates, products and services to assure conformance with the specified requirements.
- **Internal failure costs:** these costs occur when the results of work fail to reach designed quality standards and are detected before transfer to customer takes place
- **External failure costs:** these costs occur when products or services fail to reach design quality standards but are not detected until after transfer to the customer.

Dahlgaard et al, (1998) identified that failure costs are normally divided into two groups internal and external. Internal failure costs are those which accrue when defects and problems are discovered inside the company. These costs are typically those of repairing defects. External failure costs are those which accrue when the defect is first discovered and experienced outside the organisation.

4.2.5.4 Self-assessment

Self-assessment is considered as an important element for organisational change, growth and improvement (AL-Omaim, 2003). Ford *et al* (2004 p.1175) pointed out that “*self-assessment is increasingly prevalent in many organisations*”. Recognition of the value of self-assessment became public knowledge when the Deming Prize was launched in Japan in 1951 (Jackson, 1999). It is increasingly prevalent in many organisations. Although managers perceive self-assessment as internally driven, the well-known link between organisational activities and the external environment suggests that outside forces play a significant role (Ford et al., 2004). The growing importance and considerable prestige that quality awards hold have encouraged companies to adopt “excellence models” as evaluation frameworks for organisational self-assessment (Biazzo and Bernardi, 2003). In Conti’s (1999) definition, three self-assessment possesses are required: a) results, or satisfaction of internal and external users; b) process measurement; c) adequacy of quality system.

Oakland, in 2003, indicated that a number of approaches could be employed in order to carry out self-assessment throughout the organisation. These approaches include: discussion group/workshop methods; surveys, questionnaire and interviews; pro formas; organisational self-analysis matrices; an award simulation; activity or process audits; hybrid approaches.

Zairi (1996) argued that self-assessment helps an organisation in many ways. It provides organisations with an opportunity to take a broader view on how TQM is impacting on various business operations. It helps in measuring the performance of processes and enablers and their relationship to results and measuring in financial and non-financial areas. Also, it helps in measuring internally and externally, including the community and the environment, and enhances an organisation to make objective assessment through third party involvement. Furthermore it provides an organisation with the opportunity to benchmark and compare like for like. He added that measuring for improvement rather

than for hard control and creating the desire to do better and perhaps even win awards are other advantages which could be achieved by self assessment.

Oakland (2003) mentioned that self-assessment is concerned with what an organisation has achieved, and is achieving, and addresses the following issues:

- the measures used to indicate performance
- the extent to which the measures cover the range of the organisation's activities
- the relative importance of the measures presented
- the organisation's actual performance
- the organisation's performance against targets and, wherever possible
- comparisons of performance with similar organisations
- comparisons of performance with best class organisations.

Jackson (1999 p. 63) realized, in her review of application in the health field, that:

“From the perspective of the general manager, an appreciation of visible leadership was developed in that getting personally involved in some of the quality improvement initiatives proved vital. Moreover, this personal involvement enabled the general manager to improve verbal communications, demonstrate support and commitment for the quality initiatives (possibly providing resources and/or training opportunities), reinforce empowerment and work alongside staff she would not normally have come into contact with.”

4.2.5.5 Benchmarking

Benchmarking and performance evaluation are components of recent management practices and are part of total quality management (Chen, 2002). It is considered as a

way of measuring an organisation's strategies and performance against best-in-class organisations, both inside and outside their own industry. The purpose is to identify best practices that can be adopted and implemented by the organisation with the purpose of improving company performance (Freytag and Hollensen 2001). Benchmarking has been widely implemented in such business processes as corporate mission statements, employee development plans and organisation reconstruction (Chen, 2002). The Xerox Corporation is the company that pioneered this concept in the United States (Wheelen and Hunger, 2004). It was reported in the late 1990s that all 500 organisations were using benchmarking on a regular basis, which means that the number of manufacturers using benchmarking techniques has increased dramatically (Kumar and Chandra, 2001).

The main aim of benchmarking is to improve products and processes in order to meet customer requirements better (Freytag and Hollensen, 2001). In recent years, industry practices have evolved their strategic and operational decisions taking customer satisfaction into account. Specifically, for each stage of product development and production, the organisation needs more details on customer demands than are provided by the traditional market research. Until now, it seems that no research paper on benchmarking emphasising the customer's voice has been published elsewhere (Chen, 2002). Benchmarking searches for best practices that will lead to superior performance and helps an organisation to learn its strengths and weaknesses-and those of other leading organisations- and incorporate the best practices into its own operations. The term best practice refers to approaches that produce exceptional results, are usually innovative in terms of the use of technology or human resources and are recognized by customers or industry experts. The benchmarking process can be described as (Evans, 2005):

- to determine which functions to benchmark
- to identify key performance indicators to measure
- to identify the best-in class companies

- to measure the performance of the best –in- class companies and compare the results to your own performance
- to define and take actions to meet or exceed the best performance.

Freytag and Hollensen (2001) identified that there are several types of benchmarking based on what the organisations want to benchmark.

- Internal benchmarking: benchmarking against internal operations is one of the simplest form of benchmarking because most organisations have similar functions inside their business units. The immediate benefit comes from identifying the best internal procedures and, subsequently, transferring them to other parts of the organisation
- Industry (functional) benchmarking is the measurement of various facts of the organisation's functional operations and a comparison of these to similar measurements from other companies within the industry group.
- Competitive benchmarking: this type of benchmarking is used against direct competitors. Performed externally, its goal is to compare organisations offering competing products, services or processes in the same market. With direct competitors, information is not easy to obtain.
- Generic benchmarking: benchmarks the similar procedures at dissimilar organisations. Although it is considered relatively effective, it is difficult to implement. Process benchmarking needs a broad conceptualisation of the entire process and a thorough understanding of procedures.

In addition, Ross (1999) suggested another type, which is universal benchmarking. It provides the richest source of insight and is much preferred over competitive benchmarking. It aims to improve products or services to enable the organisation to become a best practice one. It allows organisations to stress best performers, irrespective of industry. They can obtain insights that allow them to leap ahead of competitors,

instead of merely keeping apace. The value of universal benchmarking is no secret. Every year, organisations like Motorola and Xerox receive literally thousands of requests for benchmarking visits and not all those requests come from electronics companies.

Wheelen and Hunger (2004) pointed out that the benchmarking process usually involves identification of the area or process to be examined:

- find behavioural and output measures of the area or process and obtain measurements
- select an accessible set of competitors and best-in-class companies against which to benchmark
- calculate the differences between the company's performance measurements and those of the best-in-class, and determine why the differences exist
- develop tactical programmes for closing performance gaps
- implement the programmes and then compare the resulting new measurements with those of the best-in-class companies.

Ross (1999) suggested three justifications for organisations to embark on benchmarking activities:

- culture change: benchmarking allows organisations to set realistic, rigorous new performance targets; this process helps convince people of the credibility of these targets
- performance improvement: benchmarking allows the organisations to define specific gaps in performance and to select the processes to improve

- human resources: benchmarking provides a basis for training.

Better understanding of strengths and weaknesses of processes, improved cycle time, improved suppliers management, reduced production cost are the benefits identified from benchmarking. However, not all organisations find it easy to employ benchmarking tools effectively as a result of lack of a complete understanding of benchmarking (Kumar and Chandra, 2001). The benchmarking step “identifying the best practice” was perceived to make benchmarking effective and resulted in increasing profitability, maintaining the competitive advantage and increasing the competitive advantage (Kumar and Chandra, 2001).

Roden and Dale (2000) stated that quality costing can be considered as a measurement of a company’s performance with respect to the process by which a product is produced or a service is delivered.

4.2.6 Continuous improvement

Continuous quality improvements, and achieving quality through the backing of all in the concern, are considered as the key pillars of TQM philosophy (Mjema et al., 2005). Continuous improvement is considered as a basic concept to organisation success. Customer requirements are not static. A special product feature that is considered innovative today will be considered just routine tomorrow (Temtime and Solomon, 2002). Walsh et al., (2002) pointed out that successful TQM strategies and programmes depend on the concept of continuous improvement.

Continuous improvement in the quality of product and service is considered one of the most important dimensions of the TQM programme. It is used for many goals and aims to eliminate defective products, reduce waste due to excessive variability and slash

production/operation lead times (Tsang and Antony, 2001). Deming (2002, p.23) asserted the significance of continuous improvement in his philosophy. He states:

“Improve constantly and forever the system of production and service, to improve quality and productivity; and thus constantly decrease costs”.

TQM implementation, together with the implementation of a quality conscious culture, can cause a cyclical effect to take place in organisations. Improved quality can lead to improved customer satisfaction which, in turn, leads to improved product reputation which, in turn, can lead to increased sales and profits (Walsh et al., 2002). A customer satisfaction requirement involves the continuous improvement of products and processes. It is argued that the most effective way of development is to use the people who do the job to recognize and implement appropriate changes (Hill and Wilkinson, 1995). Burrill and Ledolter (1999) mentioned that continual improvement can transport real results, such as reduced defect rates, a lower cost of quality and an enhanced financial picture, as well as intangible results, such as pride and satisfaction.

The “plan-do-check-act” cycle is applied to processes. The “plan” establishes the goals and processes that are required to deliver results in accordance with customer demands and needs and the organisations policies. The “do” implements the processes, the “check” monitors and measures the processes and products against policies, goals and needs and reports on the results and the “act” takes actions to repetitively progress process and system performance (Lewis et al., 2006). Evans (2005) indicated that there are several types of improvements:

- enhancing value to the customer through new and improved products and services;
- improving productivity and operational performance through better work processes and reductions in errors, defects, waste;

- improving flexibility, responsiveness and cycle time performance;
- improving organisational management processes through learning.

Harrington (1995) highlighted that continuous improvement is the major driving force behind the improvement effort and that breakthrough improvement only serves to jump-start a few of the organisations' critical processes. The organisation cannot become the best or stay among the best using breakthrough improvement alone.

Breakthrough improvement enables an organisation to catch up with the performance of the competition or match an expectation in sector performance. Competitiveness, once established, must, thereafter, be maintained by a programme of continuous improvement.

An organisation that is just stating its improvement process activities should first direct its efforts to continuous improvement, creating a working base. Then they should extend its improvement effort to include breakthrough improvement. As it starts to apply breakthrough improvement to its critical business process, it should consider using all three breakthrough improvement approaches:

- process benchmarking
- process redesign
- new process design

In order to keep pace with other organisations within a fast-changing environment, an organisation has to obtain full advantage of both continuous improvement and breakthrough improvement.

The Japanese were the forerunners of the concept of 'Kaizen' or "continuous improvement". Up-to-date improvement is increasingly becoming the foundation stone of any organisation in applying TQM (Sureshchandar et al.2001). As mentioned by Burrill and Ledolter (1999), 'Kaizen' or continuous improvement has a number of objectives:

1. to provide products and services that satisfy customers;
2. to steer the organisation to higher profitability through improved work procedures, fewer defects and lower costs;
3. to help employees fulfil their potential for achieving the organisation's goals.

Marler (1998), after studying how TQM training affects continuous improvement, suggested that employee continuous improvement is dependent upon how work is designed and incorporated into the organisation's IT. Temtime and Solomon (2002) asserted that continuous improvement is not about solving isolated problems as they occur. Quality improvement must be undertaken in a systematic, continuous and step-by-step method. It deals with making decisions which depend on data, looking for original causes of problems and looking for permanent solutions, instead of relying on rapid fixes.

4.2.7 Suppliers relationship

Suppliers are those organisations that provide the company with goods and services that help them to satisfy the demands and requirements of their own customers (Evans, 2005, Al-Qudah, 2006). Suppliers' quality management is a significant element of TQM because materials and purchased parts are often a major source of quality problems (Zhang et al., 2000). Organisations and their suppliers are interdependent; a mutually beneficial relationship would enhance the ability of both to generate value (Lewis et al., 2006). The TQM perspective supports close corporation among companies and their suppliers which has several benefits for the companies (Clifton, 2001; Jabnoun, 2000). Forza and Filippini (1998) and Zhang et al. (2000) stated that the suppliers play a well-recognised, significant role in quality management and they have a clear influence on several quality dimensions.

Deming (1986) focused on the importance of selecting suppliers on quality rather than on price alone and working directly with the selected suppliers to achieve the highest possible quality supplies. There are two types of suppliers, internal and external. An internal supplier is any person or group in the organisation that supplies a product to an internal customer. An external supplier is any one outside the organisation that supplies products to the organisation (Burrill and Ledolter, 1999).

Baidoun (2004), in his study in Palestine, identified that the internal customer-supplier relationships must be created to develop the customer's satisfaction. The quality of goods and services received from suppliers, the upstream portion of the supply chain, has an important effect on the quality of goods and services that downstream customers receive (Evans, 2005). Customers would be taking advantage of their higher bargaining power in the relationship so as to impose lean practices on their suppliers, at the expense of their profitability (Arkader, 2001). Evans (2005) indicated that the governing principles describe customer and supplier relationships under the total quality concept:

- recognition of the strategic importance of customers and suppliers;
- development of win-win relationships between customers and suppliers;
- establishing relationships based on trust.

The relationship between supplier and buyer is considered as one of the most important parts of the quality improvement process (Crosby, 1989). Supplier partnership includes supplier selection, supplier assessment, meetings and discussion, joint planning and supplier's quality control. The period of traditional adversary relationship between buyer and suppliers is over (Temtime and Solomn, 2002). Rad (2006), in his study, found that partnership with suppliers as a TQM factor leads to increases in productivity and employees' and customers' satisfaction. Chung et al., (2006) pointed out that Japanese retailer economic dependence on suppliers is an output of Japanese retailer long-term orientation.

Once Japanese retailers have relationships with suppliers, they aim to keep a long-term relationship. Therefore, retailer economic dependence on suppliers is taken for granted. The stronger the long-term orientation the Japanese retailer has with its suppliers, the extra dependent they are on suppliers. If organisations pursue good supplier quality management, they should establish long-term co-operative relations with their suppliers, often participate in supplier quality activities, have detailed information concerning supplier performance, give feedback on the performance of suppliers' products, regularly conduct supplier quality audits and regard product quality as the most common element for selecting suppliers (Zhang et al., 2000).

Richardson (1997) indicated that the company believes that the supplier must meet specific goals: "*continuous improvement in quality and productivity, waste elimination, process control, manufacturing flexibility, standardisation, and defect prevention*". Thakur (2002) asserted that suppliers need to be evaluated and selected on their ability to supply the product or service in accordance with the organisation's requirements. Gonzalez-Benito and Dale (2001) identified that when organisation intends to establish co-operative and lasting suppliers relationships, a vital factor is the choice of suppliers. That means the price is no longer the major discriminating criterion; it is replaced by quality and reliability needs. Two main instruments are used to collect the information needed for this selection procedure: quality system certification and the maintenance of quality and reliability performance records.

4.2.8 Quality communications

Communication is a very significant element in TQM philosophy. Since employees at all levels within an organisations have responsibilities to perform quality improvement project, they need to have the feedback in order to know if their last decision making on improvement actions was appropriate or not. The ability to control what they do and the authority to implement improvement should be given to employees. Guidance from

management is important to ensure that the organisation's goals are met (Tsang and Antony 2001). Communication is linked in the quality process inextricably, yet some executives find it hard to let others know about the plan in a way that will be understood. A further difficulty is filtering. As senior management's vision of quality gets filtered down through the ranks, the vision and plan can lose both clarity and momentum (Ross, 1999).

Ross's (1999) claimed that effective communication concept can provide organisations with a practical approach for communicating about quality. It only remains to encode the message(s) in terms of recipient understanding. The vehicles for communicating about quality are selected components of the TQM system.

- Managers' and employees' training and development. Managers must understand the processes they manage, as well as the essential concept of systems optimization. Employee training should be concentrated on the combination and appropriate use of statistical tools and problem-solving methods.
- Participation at all levels in establishing benchmarks and measures of process quality. Involvement is both vertical in the hierarchy as well as horizontal by the cross-functional team.
- Employees' empowerment by delegating authority to make decisions regarding process improvement within individual areas of responsibility, so that the individual "owns" the specific process step.
- Quality assurance in all company processes, not only in manufacturing and operations, but in business and supporting processes as well.
- Human resource management systems that facilitate contributions at all levels (up and down and across) of the organizational chart.

Open methods of communication and participation should be used at all levels. Obstacles may have to be broken down by concentrating on process rather than departmental issues (Oakland, 2003). Communication between managers and employees is considered a significant process and critical for implementing their business strategy and improving productivity. This confirms what is already known about TQM and communications. When communication fails or misguides the cause, it can usually be traced to bureaucratic obstacles or a misunderstanding about what is to be done. Again, nothing can sabotage a quality movement faster than managers who are not engaged in it (Ross, 1999).

As indicated by Oakland (2003), communication can influence people's attitude and behaviour. The essence of changing attitudes is to gain acceptance through excellent communication processes. He added that most organisations have four audience groups: senior managers, middle managers, supervisors and employees. Each has a different general attitude towards TQM. The senior management must ensure that each group sees TQM as being beneficial. He added that people must know when and how they will be brought into the TQM process, what the process is, and the successes and benefits achieved. First line supervision has a significant role in communicating the key message and overcoming resistance to change.

Sila and Ebrahimpour (2002) pointed out that some studies found that communication plays a significant role in successful TQM implementation. Communication factors that were extracted in these studies involved:

- the importance of effective communication across functions and work units to ensure that customer requirements are addressed and that an environment of trust and knowledge sharing is created;
- the communication of TQM within and outside the organisation, per se.

The digital Switching and Customer Service Division of Northern Telecom Canada Ltd. has received awards and international recognition for its quality system and procedures.

Continually communicating the importance of quality to its 500 employees is considered critical by division management. Three internal communications specialists create daily newsletters, monthly, monthly newspapers and videos (Ross 1999).

4.2.9 Quality structure

TQM structure is generally perceived to de-emphasize status distinctions while emphasizing employees empowerment (Crosby, 1979; Deming, 1986). There have been increased focuses on the importance of organisational structure in ensuring successful TQM implementation (Jabnoun, 2005; Shea and Howell, 1998; Waldman and Gopalakrishnan 1996). To make a company's beliefs and intentions effective, they must be backed by suitable processes and an effective organisational structure. Included in the organisational structure should be an effective quality assurance group whose mission is to support management's efforts to achieve quality (Burrill and Ledolter, 1999).

The characteristics of an organisation can even affect TQM implementation at various sites within an organisation. This was emphasized by Van Der Akker (1989), who described how TQM needed to be implemented differently within Aery Materials Group Europe because of the culture differences between the organisation's eight manufacturing plants and 15 sales offices (Mann and Kehoe, 1995). TQM is generally easier to implement within one site than in a number of sites. The larger number of sites causes the greater the difficulty of controlling implementation and developing an integrated approach to TQM. They added that TQM implementation will be easier if the organisational structure is stable, but it can be threatened by an unstable organisational structure (Mann and Kehoe, 1995).

Mann and Kehoe (1995) emphasised that TQM is likely to be more rapidly accepted in a "new organisation" or a "young organisation" than in an established one. A new or young organisation can introduce TQM as a natural element of its organisation while an established organisation may need to introduce some change, which means it will not be

easily accepted by the organisations' members. Evinco (2005, pp. 194-195) asserted the importance of the organisation quality structure when he referred to the effect of poor organisation design by saying:

“Poor organisation design can be devastating to a company; one of Deming’s 14 points is to “break down barriers between departments” because “people in various departments must work as a team”. This slogan captures in a nutshell what the TQ philosophy entails for organisational design. People cannot contribute to customer satisfaction and continuous improvement if they are confined to functional prisons where they cannot see customers or hear their voices. Some of the more effective ways to break down these barriers are to focus on processes, recognise internal customers, create a team-based organisation, reduce hierarchy and use steering committees.”

Burrill and Ledolter (1999) pointed out that structure facilitates innovation and achievements which have features such as:

- assignments are couched in terms of results, not means
- job charters are broad; people are told what they may not do rather than what they may do
- there are multiple reporting relationships and matrix management
- resources are decentralized
- there are devices to facilitate networking
- territories intersect.

4.2.10 Customer focus /satisfaction

Customer focus and satisfaction is considered as a significant factor of the TQM movement because, by addressing customers' needs and expectation, and anticipating and responding to their evolving interests and wants, organisations can outscore their competitors (Sureshchandar et al, 2001). Deming (1986) mentioned that customer

satisfaction is the ultimate reason for TQM philosophy and implementation. Subsequently, quality has no meaning without reference to the customer. In terms of a company's success, customer satisfaction is considered one of the most widely covered topics in the literature. This significant interest is justified by the increasing appreciation of the importance of the customer to any business (Adebanjo, 2001). Customer satisfaction is considered to be a basic determinant of business success. It has a considerable effect on organisation performance (Athanasopoulos, 1997). Tsang and Antony (2001, p.133) argued that "*Understanding, satisfying and surpassing customer needs and expectations on a continuous basis should be the key goal of TQM*". Consumers' demands and expectations have always been in the mind of all employees. It is necessary to identify these needs and expectations and their level of satisfaction.

Organisations must understand that their success depends extensively on customers. Therefore, organisations should understand and determine customer demand and expectation by achieving their needs and striving to exceed their expectations (Lewis et al., 2006). Customer needs revolve around several dimensions of quality, such as performance, features, reliability, and so on. For services, five core dimensions are reliability, assurance, tangibles, empathy and responsiveness (Evans and Lindsay, 2002).

Zhang et al., (2000) indicated that, in order to improve customer satisfaction, customer complaints should be treated with high priority. A guarantee on sold products should also be provided. Methods that can be used for customer focus efforts include collections of customer complaint information, market investigations and customer satisfaction surveys. Chapman and Al-Khawaldeh (2002) emphasised the need for adopting the customer satisfaction element in companies that applied TQM philosophy and they considered it as key element for fixing and resolving customers' problems and complaints.

Evans and Lindsay (1999) indicated that ever-improving value of products and services is directly connected to satisfaction of customers. Retaining customers was viewed as

being dependent on achieving higher levels of satisfaction than those of the organisation's competitors. Globally, customer satisfaction approaches are fairly universal among successful and award-winning TQM organisations. Motwani (2001) pointed out that an external customer service programme should include providing customers with timely information, a rapid response to complaints and maintain a corporate objective to decry the quantity of questions or complaints, while recognising that all successful efforts by employees in providing outstanding service measures need to be those which show where improvement has been made and where improvement is possible, more than merely monitoring people's work.

Acquiring information about customers is significant for understanding customer needs and achieving their satisfaction. In this concern Evans (2005) discussed that the most accepted ways to collect information about customers are surveys service evaluation cards, focus groups and listening to what customers say during business transactions, especially when they complain. Customer satisfaction translates directly into increased profits. However, while satisfaction is significant, modern companies have to look further. Achieving strong profitability and market share requires loyal customers (Evans, 2005).

It is evident that there is a shortage in the number of studies of the recent failures of the Internet companies. Alomaim et al, (2003) mentioned that the transformation process in virtual companies includes customers as a major and key input of an operation, in which the demands are processed to create a satisfied customer as an output. Therefore, they argued that a satisfied customer is a critical factor for a successful Internet company. In addition, many Internet companies have yet to practice the TQM principle. In fact, the virtual business environment has to increase a clear and correct concept of, and treatment for success. The ultimate objective of TQM is customer satisfaction, which requires intensive attention being paid to the customers. The ultimate customer

satisfaction is, however, not free. The more attention companies pay to further emphasise the cost of customer satisfaction, the less overall cost is incurred in the virtual environments leading to the ultimate aim of any business, higher profitability.

4.2.11 Management information systems (MIS)

Information is the critical enabler of TQM. Successful organisations agree that information technology and information systems serve as core to their quality success (Ross, 1999). Bharati and Berg (2003) indicated that information quality is identified as a significant element that influences service quality. In addition, quality improvement of service is one of the main reasons why organisations are investing in information systems. They added that The National Research Council, in 1994, observed that improved quality is a most significant output of an information system or that IS has substantially improved service sector performance (Hu et al, 1998).

Information systems are considered as the key enabler of TQM implementation. It is claimed by Zadrozny and Ferrazzi (1992) and Konstadt (1990) that information systems function plays a key role in the TQM initiative through the strategic, human resource and technology areas. However, Twaissi et al (2008, p.120) concluded that “*effective information systems play a successful role in TQM implementations, an issue that is not well demonstrated in the literature*”.

The dimension ‘quality information systems’ considers information flows and information technologies which support managers and employees in their activities in order to improve quality performance. Information technologies are separate from information flows since information flows can take place even without information technologies and the presence of information technologies does not necessarily guarantee the achievement of information flows (Forza, 1995). Effective decision-making is based on relevant information. The information systems function provides reliable and crucial information for management in a timely way so that the outcomes

permit a company to reach a competitive edge over their competitors. Therefore, searching for an effective method to assure a high quality service of information systems function is highly focused on information systems literature (Chow and Lui, 2001). It is anticipated that the application of information technology (IT) in quality management will promote the operation responsibilities of quality management and, hence, enhance quality output (Mjema et al, 2005). The inclusion of management information systems with strategic planning has been suggested as a necessary requirement of strategy formulation and implementation (Ross, 1999).

Nowadays, managers are facing an information excess; consequently they have too much information available. However, they lack recent, relevant and reliable information. Organisations often forget to screen their competitive environment, even though information on competitors and core technologies is relevant to managers. Although there have been arguments on data quality, the information quality has been ignored most of the time. In addition, there is no adequate understanding of how the information and data quality can be improved in practice. Information management is a key competence of the modern organisation input, managing it and producing more of it; therefore, development of information quality should be the focus of quality information (Gelle and Karhu, 2003). Information technology application in various areas, including quality management, is growing and continually expanding. One of the reasons for this growth rate is the dramatic increase in the cost/performance ratio of all types of computer technology (cited in Mjema et al. (2005) to Mensching and Adams (1998).

Strong et al., (1997) and Wang (1998) identified four types of stakeholders in information quality studies:

- information producers
- information custodians
- information consumers
- information managers.

Hu et al. (1998) argued that business challenges include: understanding and satisfying customer needs; monitoring and staying ahead of the competition; determining industry trends and adapting to the challenges; increasing market share; entering new markets. To meet these challenges, companies need information such as:

1. industry analysis
2. company profile
3. product/ service assessment
4. competitive analysis
5. trend monitoring
6. key issue identification.

The design of an information management system should be accompanied by the strict identification of relations among the subsystems and the relevant inputs and outputs (Lari, 2002). Leading practices of information management should include: developing a set of performance indicators that reflect customer demands and needs and key business drivers; using comparative information and data to develop performance; involving everyone and ensuring that information is widely visible throughout the company; ensuring that data are reliable and accessible; using sound analytical methods that support strategic planning and daily decision making; continually refining information sources and practices (Evans and Lindsay, 2002).

Mjema et al. (2005) indicated that the use of information technology in quality management can improve quality through:

- 1- enhancing quality awareness
- 2- reduction of quality costs
- 3- speedy processing of quality data
- 4- online information about the quality level.

Giffi et al, (1990) pointed out that information plays a significant role in shaping quality improvement strategy but does not recognise the quality information system dimension. They added that the intrinsic nature of the company's information-processing characteristics is rarely neutral and can either bolster or impede employee involvement (cited in Forza, 1995).

Duran-Arenas et al (1998, p. 455) concluded that one of the main obstacles in the implementation of continuous quality improvement programmes in developing countries is the lack of timely and appropriate information for decision making. They stated that:

“Quality information system in Mexico is an evolving process in an ongoing effort to use data for effective and efficient decision-making in the planning, monitoring and evaluation of the services delivered by the national health care system”.

4.2.12 Policy and strategic planning

Successful implementation of TQM requires long-term strategic planning quality. Pioneers and writers strongly emphasize the important of a strategic planning process based on the concept of total quality (Deming, 1986; Crosby, 1979; James, 1996; Sinclair and Ziri, 2001; Sureshandar et al., 2001). Strategic planning includes a mission and vision statement, external environmental analysis, objectives, strategies, projects and action plans, and implementation and control. This planning is helpful and useful in achieving the overall goals of the organisation and the ability to take the right decision in the case of non-compliance (Abu-Hamattah et al., 2003). The 1999 Baldrige Reward criteria for excellence performance includes strategic planning, which presents strategic and business planning and deployment of plans. This includes effective development and deployment of business, customer and operational performance demands derived from strategy (Ross, 1999).

Pacios (2004) indicated that an extensive part of business management literature considers that planning process has gone through three stages: long-term planning; strategic planning; strategic planning management. James (1996) suggested seven general quality planning processes for developing an organisation:

- 1- environmental analysis
- 2- quality mission
- 3- setting a quality policy
- 4- generating strategic quality goals
- 5- establishing quality action plans
- 6- quality strategy implementation
- 7- monitoring and evaluating quality performance.

According to Evans and Lindsay (2001), strategic quality planning is a systematic approach to setting quality objectives. Traditionally it took place at low levels in the organisation and was emphasised on marketing and technology. Through its use organisations could accomplish the following tasks:

- 1- understand key customer and operational requirements as inputs to setting strategic directions
- 2- optimise the use of resources and ensure bridging between short-term and longer-term requirement
- 3- ensure that quality initiatives are understood at the three key levels of the organisation: the company/organisation level; the process level; the individual level
- 4- ensure that work organisations and structures effectively facilitate the accomplishment of strategic planning.

It is evident to the organisations that implement strategic planning achieves better performance than others that do not (O'Regan and Ghobadian, 2002). There are a number of distinct advantages of integrating the chosen process initiative and strategic

planning, such as the effective deployment of the initiative based on continuous and up-to-date strategic environmental analysis, a recognition of the potential obstacles to deployment and a greater understanding of management performance (O'Regan and Ghobadian, 2002). Bonn and Christodoulou (1996) argued that there are several significant functions of strategic planning which serve as a tool to facilitate strategy development and implementation. In order to achieve this function, organisations have improved the flexibility of their planning systems and decentralised strategic planning to division, or business units. They have formalised strategic planning systems and provided a forum for discussion between corporate and divisional or business unit management. The planning duties were moved from staff personnel to line manager and formal meetings were used to encourage the addressing of strategic issues on a regular basis and to help generate stronger commitment from line management. O'Regan and Ghobadian (2002) mentioned that there are several benefits of a formalised strategic planning process:

- strategic planning is included on the corporate agenda
- strategic planning is approached in a systematic manner
- the strategic planning process increases staff awareness and enhances participation in the strategy.

Baidoun (2004) indicated that developing a quality policy must reflect the organisation's mission including corporate values, expectations and focus. Zairi and Youssef (1995) stated that senior managers should play important roles in developing a comprehensive policy. This policy must be based on a clear vision and mission that includes quality goals deployed effectively at all levels of the organisation and the policy as a part of the management commitment. Policy development is seen as an integral part of management's commitment to quality (Juran, 1974). Quality policy is considered as a standard for practice that sets priorities by influencing the entire organisation on what to do and what not to do (Crosby 1979). Zairi (1999) presented Royal Mail (UK) as an example of an organisation that formulated its policy and strategy by using the concept

of total quality to demonstrate that mission and values are the fundamental inputs to total quality

- the journey from policy and strategy formulation to implementation and achievement of results is managed by three processes, strategic direction setting, planning and performance measurement /review
- ownership of elements of the EFQM model is by cross-functional forums that examine feedback to identify, plan and implement responses.
- all business units maintain documented management processes which are reviewed to ensure their relevance.

Jarrer and Aspinwall (1999) suggested that initiatives such as total quality management often fail as a result of the shortage of strategic business planning. The literature contends that the shortage of strategic business planning is an essential drawback in the implementation of business process initiatives such as TQM (O'Regan and Ghobadian, 2002).

Table 4.2 comprehensive list of quality factors and literature support

Critical quality factors	Supporting Literature
Leadership	Feigenbaum, (1989); Deming, (1986); Crosby, (1979); Juran, (1993); Evans and Lindsay, (2001); Sila and Ebrahimpour (2002); Salaheldin (2003); Evans (2005); Tsang and Antony (2001); Dahlgaard et al (1998); Abu-Hamattch et al (2003); Juran and Gryan (1980); Okaland (2003). Al-Khalifa and Aspinwall (2000); James (1996).
Quality communication and structure	Crosby, (1979); Deming, (1986); Ross, (1999); Zairi, (1999); Oakland, (2003); Juran, (1988); Sila and Ebrahimpour (2002); Ishikawa, (1976); Jabnoun, (2005); Shea and Howell, (1998); Burrill and Ledolter, (1999). Evince, (2005)
Employee empowerment	Deming, (1996); Zairi, (1999); Evas and Lindsay, (2001); Ahire et al., (1996); Wilkinson, (1998). Karia, (2006) Osuagwu, (2002). Ross (1999) Wilkinson (1995); Oakland, (2003); Motwani (2001); Hing et al (2001).
Employee training	Deming, (1996); Juran, (1974); Evans and Lindsay, (2001); Okaland (2003); Ishikawa, (1985); Crosby, (1979); Feigenbaum, (1989); Kanji and Asher (1996); Dale (2003); Curry and Kadasah, (2002); Motwani, (2001); Tsang and Antony (2001).
Continuous improvement	Tsang and Antony, (2001). Deming (1986); Mjema et al., (2005); Temtime and Solomon, (2002); Walsh et al., (2002); Hill and Wilkinson, 1995; Evans, (2005); Sureshchandar et al.(2001).
Quality measurement and benchmarking	Deming and Crosby, (1979), Evans and Lindsay, (2001); Motwani, (2001); Chen, (2002); Evans and Lindsay, (2001); Ahire et al (1996); Ross, 1999; Crosby, (1979); Juran, (1978); Macdonald, (1998).
Customer satisfaction	Deming, (1986); Juran, (1988); Crosby, (1979); Evans and Lindsay, (2001); Tsang and Antony (2001); Lewis et al., (2006); Alomaim et al., (2003); Zhang et al., (2000); Sureshchandar et al, (2001). Adebajo (2001). Athanassopoulos, (1997); Chapman and Al-Khawaldeh, (2002); Motwani, (2001); Evans, (2005); Ross, (1999).
Policy and strategic planning	Deming, (1986); Juran, (1993); Crosby, (1979); Feigenbaum, (1989); Ocaland, (2003); Evans and Lindsay, (2001); Zari, (1999); Ross, (1999); Sureshchandar et al., (2001). Sinclair and Ziri, (2001); Abu-Hamattch et al., (2003); Pacios (2004); James (1996); O'Regan and Ghobadian, (2002); Baidoun, (2004); Zairi, (1999).
Quality Organisational culture	James (1996); Oakland (2003); Rad, (2006); Guangming et al., (2000); Kujala and Lillrank, (2004); Najmi and Kehoe, (2000); Tsang and Antony (2001); Temtime and Solomon (2002); Gotzamani and Tsiotras (2002); Prajogo and McDermott (2005); Berces and Hegyi (2001);
Quality Information systems	Bharati and Berg (2003); Ross, (1999); Forza, (1995); Mjema et al, 2005); Mensching and Adams, (1998); Lari, 2002); Hu, et al (1998), Zadrozny & Ferrazzi, (1992), and Konstadt, (1990);
Suppliers relationships	Deming (1986); Zhang et al (2000); Crosby, (1979); Evans, (2005); Al-Qudah, (2006); Zhang et al., (2000); Lewis et al., (2006); Clifton, (2001); Jabnoun, (2000); Forza and Filippini, (1998); Burrill and Ledolter, (1999); Baidoun (2004); Evans, (2005); Temtime and Solomn, (2002); Rad, (2006); Chung et al., (2006); Richardson, (1997).

4.3 Impediments to TQM adoption

Many organisations and companies have faced different difficulties in implementing TQM (Rad, 2006). The relevant literature suggests that only between one-third and one-half of companies have observed significant improvements through TQM programmes (Burdett, 1994). This lack of significant success is often not a failure of the TQM concept, but a failure to pay adequate attention to the cultural and structural variables that influence TQM. TQM, unlike other programmes, involves changing the way people interact and work in organisations. It is a context-dependent programme, the success of which depends to a large extent on cultural and structural factors (Tata and Prasad, 1998).

The change of culture was found to be the first most common barrier for TQM implementation, while is also said to be one of the main determinants for the success of any programme (Gotzamani and Tsiotras, 2002). Unsuitable organisational culture is considered as the most commonly quoted reason for quality programme failure (Prajogo and Sohal, 2004). Cultural change was one of the most critical success factors for the successful implementation of TQM in the UK service sector (Tsang and Antony, 2001). Huq (2005) mentioned that failure to generate a continuous improvement culture contributed significantly towards unsuccessful implementation.

Top management commitment plays a role in successful TQM implementation. There is evidence that lack of top management commitment is one of the main obstacles to implementing TQM (Macdonald, 1998; Najmi and Kehoe, 2000; Amar and Zain, 2002; Bhanugopan, 2002; Prajogo and Sohal, 2004). As argued by Al-Zamany et al. (2002), the absence of top management commitment represents the main reason for the failure of such programmes. Masters (1996) expressed concern about the lack of top management commitment and considered it as a factor leading to ineffective TQM implementation.

Also, it could be said that traditional managers' resistance to TQM is considered as barrier of applying TQM. These resistances are grounded in three opposing principles. The first principle is that managers believe that they know better and believe that they have more to contribute in their area of responsibility than any of their subordinates; they usually have wider and faster access to more sources of information. The second principle is that the customer is not always right. Many managers have had experience of difficult and unfair customers who take deliberate advantage of a company's goodwill. The final principle is that not everything is a process (Feinberg, 1998).

Lack of employee empowerment is considered another obstacle of TQM implementation. Deming (1986) focused on the importance of empowering employees by giving them authority and autonomy. Amar and Zain (2002) argued in their study that employees' attitude towards quality is seen to be one of the greatest barriers in the respondent organisation. Some respondents found that it is very difficult to change the attitude of employees with regard to quality. They said that they believe that quality is an added cost and, hence, could not accept it as a complementary part of the job. On the other hand, Tamimi and Sebastianelli (1998) concluded in their study that many factors work against TQM implementation. One of these obstacles was not linking management's rewards to achieving quality goals and poor training in areas such as group discussions, communication techniques, quality improvement skills, problem identification and problem solving techniques.

Inefficient knowledge and understanding of the concept of TQM is one of the challenges that face the implementation of TQM (Huang and Lin, 2002). Bhanugopan (2002) considered the complications of implementation, which included lack of knowledge as the most common problem for all organisations attempting to implement TQM. Chin et al. (2000) added that lack of understanding ISO 9000 and TQM purposes are the most common barriers that make organisations fail to continue their quality management journey. As mentioned by Lilja and Wiklund (2006), there are two dimensions that currently prevent the development of practices for attractive quality creation. The first

barrier is the concept that attractive quality has varied meaning, resulting in confusion about what to obtain. The second one is the current lack of valid explanation of the occurrence of attractive quality, resulting in an inability to develop proactive practices. Zairi (1996) pointed out that failures in TQM implementation can be attributed to a wide variety of reasons, including:

- failure to sustain quality effects and change the culture of work
- failure to translate TQM principles into tangible outcomes and the lack of measurement for improvement purposes
- failure to understand that quality is a long-term process and that it needs resourcing for long-term results.

Likewise, Adebajo and Kehoe (1998), who studied TQM implementation in UK manufacturing organisations, pointed out that many problems face the quality programme. These problems are:

- top management does not insist on systematic measuring of customer satisfaction level and training programmes
- inadequate training programmes to enhance workers' skills and involvement in quality improvement activities
- companies do not place enough importance on cases of goods returned or relate such cases to customers
- many companies do not involve suppliers when making improvements to products and, in general, suppliers have problems in meeting the companies' requirements
- insufficient teamwork facilitators and team building techniques such as Belbin are employed
- worker evaluation lacks a systematic approach and hence salary adjustments are not commensurate with job functions. Appreciation of contribution by workers is not apparent.

In the USA Salegna and Fazel (2000) surveyed the barriers faced by TQM and non-TQM organisations. The results revealed three major barriers facing TQM organisations: insufficient time, poor communication and lack of real employee empowerment. For non-TQM organisations, the barriers include lack of motivation, insufficient time and lack of strategic planning for change.

Building on the previous discussion, a summary of the most common barriers to TQM implementation:

- culture issues such as culture change and unsuitable organisational culture
- lack of top management commitment
- lack of systematic measuring of customer satisfaction level
- lack of employees empowerment, poor of training programmes, insufficient teamwork facilitators
- inefficient knowledge and understanding of the TQM concept and its purposes failure to understand quality as a long-term process
- weakness of suppliers relationships
- poor communications.

4.4 Impediments to TQM adoption in developing countries

Because this research was conducted in Jordan, which is considered one of the developing countries, it is worth shedding some light on the obstacles and difficulties which face TQM implementation in developing countries. The quick globalisation of markets and the gradual acceptance of competition make it more difficult to continue to protect local markets. Developing economies must, therefore, adapt to these environmental changes and develop programmes to enable them to compete effectively (Al-Khalifa and Aspinwall, 2000).

An analysis of the TQM studies conducted in various countries revealed that there is a lack of information about the nature and stage of TQM implementation in some regions

of the world, including South America, Africa and the Middle East (Sila and Ebrahimpour, 2002). Despite the number of publications and the amount of research into TQM, little empirical work has been carried out in developing countries, particularly in the Arab world, and Jordan in particular (Al-Madi, 2005). However, the literature identifies a number of gaps in quality management in developing countries along with common challenges, including differing perceptions of quality, the legacy of colonization and protectionist policies and tight governmental controls (Gosen et al., 2005). The developing countries suffer from poor quality products. Low product quality is a term that has become synonymous with customer goods manufactured in developing countries (Lakhe and Mohanty, 1994). Sandholm (1999) referred to certain inhibiting factors relating to TQM in developing countries as low purchasing power, a shortage of goods, foreign exchange constraints, an unfinished infrastructure, insufficient leadership and knowledge.

It is evident that many of the TQM programmes implemented in developing countries fail, due to a lack of real understanding of the principles. The level of misunderstanding is obviously a cause for concern and clearly identifies the need for an effective country initiative, in particular through more education and training, to develop a quality TQM mind-set within the workforce and, in particular, the leadership (Wong, 1998). Lack of investment in training and education of employees, and in improving working conditions, are other barriers to the implementation of TQM in developing economies (Temtime and Solomon, 2002). Human resources problems were also other barriers to successful TQM implementation and include lack of effective and efficient employees for implementing TQM, non clarity of employees' responsibilities and authorities, lack of mechanisms for empowering employees, lack of non monetary enthusiasm mechanisms for developing employees' participation in TQM activities, and low salaries and benefits (Rad, 2006).

Developing countries as a group, compared with the industrialised countries, have unique environmental conditions which should be taken into account in designing

appropriate management strategies, including the introduction of effective quality management methods (Mersha 1997). Management approaches that are seen as essentially western in origin are viewed with some suspicion in many Middle Eastern and Islamic countries; this represents a barrier to their acceptance (Al- Zamany et al., 2000).

Osuagwu (2002) revealed that there are failed attempts at implementing a TQM strategy in Nigeria. The main variables implicated in such failures are: early organisational efforts that are simplistically grasped, at such as: quality circles as the only panacea to solve all corporate problems; an over-reliance on statistical methods; an under-reliance on statistical methods; the bureaucratisation of TQM efforts; the failure to recognise the relationship between TQM objectives and increased employee involvement and participation; failure to integrate major organisational functions into TQM activities, among others.

Lakhe and Mohanty (1994) pointed out that many organisations in developing countries were facing difficulties with the following problems and, hence, their ability to adopt TQM was limited:

- lack of employee involvement and participation in quality improvement efforts
- lack of management commitment and motivation
- perception that quality is the optional extra and not a necessity for development
- traditional belief that “quality costs money”
- lack of communication and trust between suppliers, dealers, management and trade unions
- unorganised, indifferent customers
- lack of political support
- lack of established quality standards and inadequate test facilities
- obsolete technologies
- low level of education.

In addition to the previous barriers, the Arab world faced many obstacles and difficulties with TQM implementation. As Al-Zamany et al. (2002) said in their study, several organisations in the Middle East have not operated as commercial organisations because of the diverse forms of government intervention. They also argued in the same study that there are Arabic organisations which have TQM programmes but, again, it has been found that there are difficulties in sharing experiences. However, TQM is a relatively new notion in the Arab World. Evidence has shown that there is poor knowledge of the key components which influence the process of TQM implementation and the way these components should be addressed and managed (Al-Marri et al., 2007).

Salaheldeen (2003), in his study about the implementation of TQM strategy in Egypt, indicated that there is a consensus among Egyptian manufacturing organisations that inadequate infrastructure, poor training, workers' reluctance to get involved in decision-making and an insufficient knowledge base, are regarded as resisting forces that inhibit the introduction of TQM strategy. Al-khalifa and Aspinwall (2000) stated that top management and support, lack of empowerment at lower employee level and the current negative work climate are the main areas of difficulty in applying TQM in Qatar. In Yemen there are three main categories of problems facing implementing quality. First, the government takes control of the selection and assessment of managers in the public companies, which means lack of government-supported programmes for quality. Second, there is a lack of technical knowledge and training. Finally, there are inappropriate managerial traditions (Al-Zamany et al., 2000). Baidoun, (2004) asserted that knowledge of TQM in the Palestinian context is still very limited. Twaissi et al (2008) indicated that the most significant TQM barriers to achieving successful implementation in Jordan are related to government influences and internal cultural characteristics.

Based on these efforts to identify the barriers which hinder TQM adoption in developing countries, it could be concluded that the main areas of difficulty encountered in TQM

implementation in developing countries include: negative culture about quality such as the view “quality costs money”; lack of trust; lack of communication; lack of suppliers relationship; lack of awareness of TQM activities such as poor knowledge and information of TQM nature; lack of employee empowerment and poor training; lack of lack of motivation and involvement; insufficient resources; lack of technologies; top management commitment and support; lack of policy and strategic planning; lack of political support and tight of government control. However, there is no clear evidence that there are investigations and empirical efforts to study the barriers that prevent the implementation of TQM Jordan.

4.5 TQM benefits

Vouzas and Gotzamani (2004) stated that any organisation applying effective quality management would instil confidence in its customers that its products would consistently conform to their specific requirement.

Many researchers in the field of TQM have described the benefits that could be gained by organisations that adopt and apply TQM philosophy. Tsim et al. (2002) and Najmi and Keho (2001) pointed out that TQM implementation could improve the efficiency and productivity of quality systems. It improves sales and achieves higher profit (Withers and Ebrahimpour 2001, and Heras et al., 2001). It is argued by Vouzas and Gotzamani (2004) that TQM helps in reducing customer complaints. It plays a significant role in improving the competitive position of organisations (Salegna and Fazel, 2000; Gunasekaran, 1999) and growing market share (Berces and Hegyi, 2001).

Furthermore, TQM implementation encourages a teamwork ethos (Pan 2003), improves staff morale, motivation and satisfaction (Berces and Hegyi, 2001; Awan and Bhatti, 2003) and improves employee-management relationships (Lee and Palmer, 1999). Increasing quality awareness within the organisation (Dick, 2000; Sun, 2000) and creating an image of better quality (Quazi and Padibjo, 1998, Pan, 2003) are others

benefits which could be achieved by implementing TQM philosophy. Some researchers have pointed out the benefits of applying TQM and its vital role in achieving a better documentation process within organisations (Quazi and Padibjo, 1998) and measuring organisations' performance (Berces and Hegyi, 2001). It could be said that TQM helps in reducing significant cost, waste and rework and improves the quality of products and services (Arora, 1996; Huarng, 1998).

4.5.1 The role of TQM in achieving competitiveness

Global competition is the name of the game today (Dutta, 2007). Today's business environment is full of life, complex and continually changing in order to gain, retain or regain sustainable competitive advantage (O'Regan and Ghobadian, 2002). TQM turned out to be one of the competitive strategies of choice during the 1990s. There is an extensive consensus that TQM is a way of managing an organisation to improve its overall effectiveness to compete globally (Kunst and Lemmink, 2000; Hendricks and Singhah, 1997; Easton, 1993). Total quality management is basically a management philosophy and has become the ideal approach for improving quality and productivity in organisations (Karia, 2006). Many world-class organisations use quality as a potent weapon to support their competitive position (Mersha, 2000).

There are several organisations which use quality as a competitive weapon. It improves quality resulting in increased productivity and profitability and strengthens the organisation's competitive position in the market. Senior quality also influences the relative competitiveness of nations in the global trade which, in turn, affects their development and the standards of living of their people. Consequently, to improve their competitive position, various organisations in industrialized nations are passionately looking to improve the quality of their goods and services. They are also aided by their respective governments in this effort (Mersha and Robert, 1997). TQM *"is an approach to doing business that attempts to make the most of the competitiveness of an*

organization through the frequent improvement of the quality of its products, services, people, processes, and environment” (Goetsch and Davis, 1995).

TQM can help private organisations reach competitiveness both in domestic and global markets and it can enable nations to reach their economic increased goals (Mersha and Robert, 1997). The common interest in using quality management to improve organisational performance started in the manufacturing sector and later spread to service organisations (Dean and Bowen, 1994). Mersha (2000) pointed out that organisations in industrialized countries that have adopted a quality-oriented strategy have achieved improved productivity, larger customer fulfilment, higher employee moral, improved management- labour relations and top overall performance.

Regarding the growing competitiveness of international markets, organisations that wish to improve product quality, cut costs, improve flexibility and shorten lead times have concentrated their efforts on effectively managing their supply chains (Carr and Kaynak 2007). The growing impact of globalisation, as well as pressure from international competition and changing business environment, raised the significance attached to the role of standardisation and this, in turn, was reflected in national standards (Salaheldin and Francis, 1998). Developing economies cannot compete abroad if their goods do not meet international standards (Madu, 1997). The changes in the international competitive environment have reflected on Jordan. Jordan adopts standards as one of its strategic venues for enhancing its organisations’ competitive capabilities (WTO-TBT) (Conti, 1999). The Jordanian standards authority developed a strategy for using standards to facilitate the local industry to raise its competitiveness and develop the performance (Rawabdeh, 2002). However, it has been mentioned that in TQM literature there is a lack of comprehensive empirical studies which investigate the relationships of individual TQM elements on TQM outcome (Ahire and O’Shaughnessy, 1998).

Competitiveness refers to the relative position of an organisation against its competitors (Cho and Moon, 1998). Karaev et al. (2007) indicated that Competitiveness was defined

by the EU Competitiveness Report (2003) as the ability of an economy to provide its population with high and rising standards of living and a high level of employment for all those willing to work on a sustainable basis. Competitive factors are the skills and capabilities that differentiate a firm from its competitors (Lau, 2002). Ramasamy (1995) pointed out that competitiveness is the capability to enlarge market share, profit and growth in value added and to stay competitive for a long duration. It is possible to conclude that a good understanding of competition is important if practitioners are to implement the practices and principles of TQM, to make the most of the competitiveness of a company's products and services (Walley, 1998). It could be argued that a competitive organisation is one that is able to compete on all dimensions of competitive priorities such as fast delivery, high quality, low price, volume and product flexibility (Singh et al, 2007).

In recent years there has been a change in the content and focus of the competitive strategies deployed by many organisations. TQM, initially employed to aid cost competitiveness by reducing waste and increasing productivity, is now the engine for facilitating the new nature of competitiveness described by responsiveness, flexibility and agility. Gilgeous and Parveen (2001) describe these to be core integrity competencies of new competition. Prahalad and Hamel (1994) describe them as capability competencies. TQM can be the key strategy development and deployment tool of an organisation, providing the structure and framework by which an organisation can adapt to the changing demand of its operating environment and the tools to align internal activity with strategic intent.

The term flexibility is used at the level of products, processes, people, management, organisation, strategy, systems, structure, nation, culture and frame of mind (Sushil, 2001). It could help in enabling organisations to adjust to shifts in customer demand (Gerwin, 1993). Flexibility enables operations to increase the scope for an organisation's market positioning. It has become a central issue in how operations can be strategically

developed to play an effective part in achieving competitive advantage (Slack, 2005). Slack (2005) identified four types of flexibility: product or new product flexibility; mix flexibility; volume flexibility; delivery flexibility.

Two flexibility dimensions are defined by Carlsson (1991):

- static flexibility, which includes the ability to deal with predictable changes such as demand changes and interruptions in the production process with an emphasis on costs due to inventory and backup systems
- dynamic flexibility, which includes the organisation's ability to deal with uncertainty created by new products or new competitors

Organisation responsiveness is considered a vital issue in determining business success (Webb and Pettigrew, 1999). Hoyt et al. (2007) claimed that responsiveness is one of the most significant characteristics required for today's organisations to possess. Kritchanchai and MacCarthy (1999) defined responsiveness as the ability to respond purposefully and within an appropriate time-scale to customer needs or changes in the marketplace, to bring about or maintain competitive advantage.

It has been pointed out by Hoyt et al. (2007) that organisational responsiveness enables companies to quickly detect market changes, reconfigure their processes to meet new market requirements, share information across organisational borders, take maximum advantage of information processing systems and adopt new products and process technologies ahead of their competition.

Agility is defined as the ability to market low-cost, high quality products successfully with short lead times and in varying volumes that provide enhanced value to customers through customization. It refers to the ability to produce and market a broad range of low cost, high quality products successfully with short lead times in varying lot sizes, which provide enhanced value to individual customers through customization (Flidner and Vokurka, 1997). Goldman et al., (1995) identified four vital dimensions of agile completion: enriching the customer; co-operating in order to enhance competitiveness;

utilizing new organisational structure to master change and uncertainty through techniques; leveraging impact of people, information and technology; recognising the importance of employees as a company asset. Fliedner and Vokurka (1997) suggested that the present competitive priority for a world-class organisation is agility.

Competitiveness can be improved using several methods; an effective and proven way is through quality, which is a major source for generating sustainable competitive advantage for organisations (Dutta, 2007). According to Cruz and Rugman (1992), competitiveness can be studied at three levels: that of the country, industry/sector and organisation. Quality and business excellence awards that recognize excellent organisational performance have emerged as an important element of the competitiveness building strategies of various countries based on the unified theories of the quality pioneers (Dutta, 2007). Al-Qudah (2006) concluded in his study in Jordan that competitiveness could be achieved by increasing organisations' profitability, market share, effectiveness and service quality.

Ajitabh and Momaya (2004) argued that an organisation's competitiveness is dependent on its capability to provide products and services more efficiently than others involved in the market place. Lau (2002), in his study, concluded that product quality, lower production cost and better supplier relationships are the three most important factors for improving their competitive position. Porter (1990) concluded that an organisation can gain competitive advantage over its rivals in two ways; namely, through cost advantage and differentiation. By lowering costs, Porter describes the ability of organisations to create and sell comparable products more efficiently than its competitors, while differentiation is the ability to meet customer expectations and requirements, through providing them with unique products or services.

According to Schwanitz et al (2002), competitiveness means the abilities of individual organisations, or whole sectors, regions and even countries, successfully to assert themselves in the domestic and global market. The competitiveness of a certain region

depends on the nature of the business environment in which organisations or industries emerge (Porter, 1990). The literature indicated that US and European manufacturing executives still rank quality as the most important competitive priority (Markland et al, 1995). However, most Japanese manufacturers now focus on time based competition and create new products (Kenney and Florida, 1993). Some developing countries have used their locational advantages, such as low labour costs, appropriate skills and infrastructure, to develop competitiveness in certain services (Seyoum, 2007). It could be said that governments in the developing countries need to support competitiveness in services by providing a conducive climate for the private sector and improving infrastructure and skills (Clark, 2000; Perrings and Ansuategi, 2000 and Seyoum, 2007).

Based on the previously mentioned literature about competitiveness, it could be said that organisational competitiveness could be achieved by increased profitability, enlarged market share, improved effectiveness and service quality.

4.5.1.1 Improved profitability

The Oxford Dictionary of Finance and Banking (2005, p.326) defined profitability as *“The capacity or potential of a project or an organisation to make a profit. Measures of profitability include return on capital employed, and the ratio of net profit to sales”*. Revenue management is defined by Cross (1997) as being *“the application of disciplined tactics that predict consumer behaviour at the micro-market level” that will “maximise product availability and price”*.

Based on evidence provided by Grout and Zalewska (2006), profitability could be measured by net present value, internal rate of return, accounting rate of return and return on turnover or sales. Net present value defines shareholder and investor wealth as all of the future cash flows discounted at the appropriate risk adjusted cost of capital. The internal rate of return is the discount rate that gives a net present value of zero when applied to a series of cash flows. Accounting rate of return is the earning of an

investment during the period divided by the capital employed in the investment at that time. A company's profitability may be measured by return on sales when it is difficult to measure assets in a business. ROS is defined as earnings after depreciation but before interest and tax divided by turnover of the business in the period.

Business results can be improved by enlarged revenues or reduced costs. Quality practices can be implemented to reach both of these goals (see, e.g. Bergman and Klefsjo, 1994; Johnson and Gustafsson, 2000). Improvements in inner quality may raise productivity and minor inner cost, thereby increasing profitability indirectly. Customizing a product to exceed the requirements of the customer can raise customer fulfilment which, in turn, has a direct result on customer loyalty and retention and, thereby, increases future sales to achieve and sustain competitive advantage (Gustafsson et al., 2003). Jeffries et al. (1996) and Hendricks and Singhal (1997) asserted that TQM implementation leads to achieve profitability. Brah et al. (2002) emphasized that, by effectively managing primary factors such as top management leadership for quality, supplier quality management and process management, employee training and empowerment could improve profitability and lower costs.

It is evident that the strategic benefits of quality programmes and better quality are proven to contribute to a greater return on investment (Cole, 1992; Philips et al., 1983). Ghobadian et al. (1994) stated that high service quality is required to improve profitability. Al- Qudah (2006) added that adopting and implementing TQM in Jordan have had a positive effect on increasing companies' profitability. Erdal and Ghosh (1997) found that one of the most significant benefits of ISO 9000 was increased sales and profit; the same findings were made by Quazi and Padibjo (1998), Sun (2000), Escanciano et al. (2001), Santos and Escanciano (2002), Bayazit (2003) and Pan (2003).

However, a study conducted in the USA by Sila and Ebrahimpour (2005) revealed a result regarding the impact of customer satisfaction as a vital and significant TQM factor on companies profitability. They found in their study that customer focus did not have

any direct or indirect effect on profitability as a business result. Wright and Snell (2002) argued that simply having a customer focus and acquiring customers may not be sufficient for success since customers can easily be lost if they have a bad experience with the products and services, or if the new entrants to the market attract them.

4.5.1.2 Increase market share

“The literature considers market share to be one of the most important indicators of organisational success. Indeed, market share is often to describe the position of a firm within its industrial sector” (O'Regan 2002 p.287). Market share can be a significant determinant of profitability in the medium to long term (Gale and Buzzell 1993). The customer fulfilment translates directly into increased profit, while satisfaction is significant in that modern companies have to look further to achieve strong profitability and market share requires loyal customers (Evans, 2005). However, according to O'Regan (2002), the impact of market share is not always reflected in a firm's profitability or performance; many firms see it as an important organisational goal. Mische (2001) argued that, while market share is a desirable strategic objective, it does not necessarily indicate high organisational performance.

O'Regan (2002) indicated that market share can be increased in a number of ways. The first way is by enhancing the perceived value of the products or by reducing the market price. The second one is by reducing the market price, or a combination of both measures. Moreover, Finlay, (2000) suggested that increased market share occurs when:

- current markets are not saturated for the types of offer the firm is making
- present customers can be induced to buy more
- increased economies of scale provide significant competitive advantages
- the firm has spare production or distribution capacity.

On the other hand, he mentioned that decreased market share occurs when there is no money available for the enhancements needed to retain markets share; the firm's market

are being hit by cheap imports and the firm's reputation has suffered and cannot be reclaimed.

The TQM literature gives evidences that improvements in quality and productivity allow organisations to raise their market share and to charge higher prices for their products and services which, in turn, results in superior profitability (Garvin, 1984). Many studies demonstrate that TQM achieves growth market share, such as Brah et al. (2002) who stated that TQM philosophy emphasizes that effectively managing primary factors improved market share. Moreover, Tsang and Antony (2001) indicated that organisations today have not only raised their market share by improving the quality of products and /or services, but also by improving their employees' performance. Brah et al. (2002) pointed out that TQM philosophy emphasised that, by effectively managing primary TQM factors, market share can be improved.

4.5.1.3 Improve the quality of products and services

Service quality is considered as a vital determinant of competitiveness. It can assist an organisation (Jannadi and Al-Saggaf, 2000). The implementation of TQM has newly shown its importance to differentiate itself from others and achieve a competitive advantage in service industries for improving the quality of service and customer satisfaction which has resulted in improved competitive advantage (Tsang and Antony 2001). Garvin (1988) identified the eight TQM dimensions or categories in services quality: performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality.

An international tendency toward service quality was initiated in the 1980s when marketers realised that a quality product was not, in itself, guaranteed to maintain competitive advantage. Customer service became a distinct and significant part of the product/service offering. This, jointly with the information revolution, has resulted in a demanding and discerning customer. Quality customer service is, therefore, imperative.

Selecting a quality supplier can also facilitate in improving the quality of products or services.

Many organisations are aware of the significance of generating long-term relationships with their suppliers which can raise their competitiveness (Zineldin and Fonsson, 2000). The 1990s marked a paradigm transfer as organisations realised that improving quality was excellent for business and required effective competition (Lovelock, 1996).

The process of managing improved service quality begins with perceiving the customer's anticipation. The expectations/ perceptions concept has been extended to integrate "desires" in evaluating customers' awareness of service quality (Van der wal *et al.*, 2002). Service quality differs from quality of goods, in that services are intangible. This presents a challenge to marketers; services cannot easily be communicated to the customer and for this reason, quality may be hard for customers to assess. Services are characterised as being intangible, perishable, produced and consumed at the same time and diverse. A foremost challenge for organisations is to deliver service quality time after time (Zeithaml and Bitner, 2000).

Jannadi and Al-Saggaf (2000) found in their study that it is significant to manage and be in charge of every service encounter in order to increase overall perceptions of service quality. Improving service quality is achieved by understanding the customer's anticipation forming process. Service quality can be improved for all customers, but there is a considerable cost in doing so. Quality has become an influential strategic weapon in global competition and trade. Improved quality reduces waste and raises productivity. In addition, improvements in quality and productivity allow organisations to raise their market share and to charge higher prices for their products which, in turn, results in superior profitability (Garvin, 1984).

Escrig-Tena (2004) demonstrated that TQM implementation achieves improved quality. Service quality can be improved for all customers. Moreover, the TQM literature shows clearly the fundamental roles of TQM factors in creating a reasonable affect on the

quality of services (Al Qudah, 2006). Escanciano et al. (2001) observed that, in Spanish companies, improving quality in general, and the organisation's operative quality in particular, have been the most important motives for ISO 9000 certification. Withers and Ebrahimpour (2000) reported that the majority of American organisations in their research were seeking certification to improve product quality and to achieve process improvement.

However, Li (1997) found that there is no association between top management leadership and service quality performance. Moreover, Wilson and Collier (2000) reached the same result and added also that there is no correlation between leadership, human resource management and strategic planning with customer satisfaction through quality service. Furthermore, Curkovic et al (2000) concluded that there is no correlation between suppliers development, product reliability and customer service.

4.5.1.4 Improving company effectiveness

There is still no general definition or model for organisational effectiveness because the goals and objectives of organisations are multiple and difficult to identify (Sekaran, 1994; Lachman and Wolfe, 1997; Rodsutti and Swierczek, 2002). Al-.Nakeeb et al. (1998, p.222) reported that effectiveness of the system is defined as: *“meeting the company's specified requirements and prescribed quality objectives”*. Also, Denison (1990) defines organisational effectiveness as *“a function of the values and beliefs held by the members of an organisation”*. Gaertner and Ramnarayan (1983 p.97) defined organisational effectiveness as *“the ability of an organisation to account successfully for its outputs and operations to its various internal and external constituencies”*. Effectiveness was defined by Siegel and Shim (2005) as *“the extent to which actual performance compares with targeted performance”*, and was defined as *“the degree to which a purpose is achieved”* in The Oxford Dictionary of Sports Science & Medicine (Kent, 2006).

Al-Nakeeb et al., (1998) argued that yet there seems to be no available evidence that they have developed way of measuring the effectiveness of their systems in meeting prescribed quality objective. However, it could be said that the measure of effectiveness of the system is dependent on what the company defined as its purpose (Al-Nakeeb et al., 1998). However, there are two major perspectives: the first is an external approach which is focused on the goals of the organisations and its relationships to its environment; the second is an internal approach based on an organisational process which is focused on productivity and employee satisfaction (Rodsutti and Swierczek, 2002). To determine the effectiveness based on internal processes, job and personal satisfaction were used (Rain et al., 1991; Atkinson et. ell., 1997).

The literature presents TQM as the ideal way to manage the organisation's effectiveness to compete globally (Kunst and Lemmink, 2000; Hendricks and Singhah, 1997; Easton, 1993). Furthermore TQM is a way of managing to improve the effectiveness, efficiency, flexibility and competitiveness of a business as a whole (Ho and Fung, 1994).

4.6 Environmental stakeholders' role in TQM implementation

The concept of company stakeholders was developed in the organization theory strategic planning and corporate social responsibility literature (Steadman et al., 1996). Turner (1999) defined stakeholders as: all the people or groups whose lives or environment are affected by the project, but who do not receive direct benefit from it. Stakeholders include groups such as shareholders, investors, customers, employees, suppliers and governments who provide infrastructures and whose laws and regulations must be obeyed, the natural environment and the communities in which a company operates (Clarkson, 1995; Starik, 1995). Turner (1999) pointed out that stakeholders could include the team's families, people made redundant by the change introduced, people who buy the product and the local community. Wheelen and Hunger (2004) stated that

both the societal and task environments must be monitored to detect the strategic factors that are likely to have a strong impact on corporate success or failure.

However, the overall understanding of the factors that determine the successful implementation of TQM is a really complex issue that can only be achieved by integrating several research topics which analyze human, managerial, technical and contextual aspects. The study of TQM effectiveness cannot be performed by only considering a single perspective since a firm's success does not depend on just one single factor (Thompson, 1967F; Fuentes-Fuentes et al., 2004). Foster and Jonker (2003) indicated that quality management has begun to adapt to the stakeholders' view of the company and include consideration of external influences and groups. They added that recent research has begun to analyze the effect of relations with external groups and individuals on the way the focal organisation is managed. At first, this research investigated bilateral relationships between groups, individuals and the organization. Very recently that has been extended to include an analysis of the multi-lateral relationships that exist between the focal organization and the external world.

Environmental concerns play a significant role in the formulation of corporate strategies (Newman et al 1994). Osuagwu (2002) found that environmental factors have substantially impacted on TQM practice in Nigerian organizations, with competition environmental variables used, including competition, government policy, technology, legal provisions, economic factors, political factors, industry structure and customer behaviour.

Steadman et al. (1996) stated that environmental groups are exerting an increased external influence on the company's production process. These external stakeholders can be very formidable in terms of product boycotts, lawsuits and regulatory delays. Walker (2000) mentioned that environmental impact is a crucial issue. Project success can be undermined by community action-group protest activity and poor environmental management can lead to public discontent and poor image for all companies involved.

Yui and Kanji (1996) have noted concern about the environment as one of the three elements that effected quality control circle activity in their cross-cultural studies. First, the basic rationale is that the TQM activities are nationwide and are not limited to a few top performers, cutting across all sectors of the socio-cultural, economic, political and technological infrastructure of an economy or nation. Those infrastructures in an economy's environment are required for planning, specifying, implementing, improving and achieving total quality. The quest for quality can come from any parties in the environment: customer, partners, suppliers, stakeholders, non-stakeholders, etc. Second, total quality emphasizes the involvement of people and necessitates a quality culture for the company internally and the entire economy externally. Third, it is believed that an organisation cannot pursue TQM successfully in the long run if its environment is not supportive of TQM practices. Historically, the management of quality has been tied to the underlying environmental conditions prevalent in societies. For example, in Europe the growth of commerce led to the development of quality warranties (Juran, 1995).

It is worth mentioning that environments of countries do change over time. Longitudinal studies could reveal the long-term effects of international factors such as change in culture, economy, or the political/legal system on quality in developing countries. Such studies would be of value to governments and international agencies in developing and implementing long-range policies (Gosen et al., 2005).

The political- legal environment can also have an effect on strategic quality planning (Hurd, 1992; Zhao et al., 1995b). The fundamental political-legal system can also have a important affect on customer focus (Lakhe and Mohanty, 1994). On the other hand, laws and policy on worker democracy and participation, such as those found in Scandinavian countries, can facilitate the implementation of employee empowerment programmes (Tonnessen, 1997).

Because quality needs to be pervasive within an organisation in order to be implemented successfully, a number of economic factors can influence it, including quality of infrastructure, resource availability, volatility, role of the private sector in the economy and the size of market (Gosen et al., 2005). Mersha and Merrick (1997) made note of the linkage between quality and infrastructure. The level of economic competition can influence the level of customer focus and satisfaction (Forker, 1990). In closed economies where government protection prevails, there is less motivation to focus on customer expectations (Das et al., 2000).

The literature suggested that the values and attitudes common in a society can influence the type of information about quality that is available to employees (Choi and Liker, 1995; Kettinger and Lee, 1995; Loveday, 1993).

The literature indicates that the government can play a significant role in encouraging or discouraging strategic quality planning (Thanassoulis et al., 1994). The government can have a positive or negative impact on the functioning of human resource practices and training programmes (Ehrenberg and Stupak, 1994). The government can also offer a strong impetus for the spread of quality management by lending moral support and legitimizing quality training programmes, and retaining control over course content and the licensing of insurance (Robinson and Schoeder, 1993). Both government and top performers need to play a leading and greater role in quality by promoting it nationally to students, employees and citizens (Wong, 1998). Government leaders recognize the benefits of TQM implementation for economic development (Sohal and Lu, 1995 and Mersha, 1997). The government's desire to promote economic development and management's stake in the success of the organization are important driving forces in TQM implementation efforts (Mersha, 1997).

Government awards can have an impact on the sort of information, and award criteria can become a vital pointer of product quality (Wisner and Eakins, 1994). Maragah and Corredoira (2001) indicated that the Baldrige Award, named after the Secretary of

Commerce Malcolm Baldrige, who was killed in an accident shortly before the Senate acted on the legislation, is administered by the Department of Commerce and awarded to American corporations. Its purposes are:

- to encourage companies to improve quality to gain a competitive edge and stimulate the economy
- to recognize quality achievements and provide an example to others
- to establish guidelines and criteria to evaluate quality improvement efforts and to make them available to be used by government and industry
- to provide specific guidance for American companies that wish to learn how to manage high quality.

4.7 Environmental stakeholders' role in TQM implementation in developing countries

In terms of cultural/social issues, the following factors were identified by the two panels as important in the context of developing countries: attitude towards foreigners; relative status of personnel; hierarchical focus; achievement focus; education level of workforce; labour turnover; customer focus; the degree of international communications. Many developing countries have low levels of literacy (Gosen et al., 2005). However, a few previous studies have identified the connection between society and quality management (Jonker, 2000; Lo and Cheng, 1997).

On the other hand, political/legal factors identified by the two panels as important to quality in developing countries include free-trade agreements with other nations, regulations, role of the public sector, central planning, governmental priorities, governmental efficiency and financial incentive (Gosen et al, 2005).

Governments in developing countries can more effectively help in enhancing local capability without diminishing quality by being more efficient themselves, providing

financial and technology support and making industrial development an important priority (Gosen et al., 2005). Local authorities have come to provide a range of services which include three principal functions: protection (police, fire services, consumer advice); welfare (personal social services); convenience (parks, recreation, collection of refuse) (Davison and Grieves, 1996). Developing countries such as China are actively seeking quality management tools to help in their economic development (Zhao et al, 1995). Historically, many firms in developing countries were state controlled or heavily regulated. As these countries have opened up to private and foreign competition, firms have had to adopt their posture from simply meeting quotas to a more long-term market orientation (Chin et al., 2001).

Al-Zamany et al. (2002) indicated that there are a number of reasons for the low level of interest in TQM for much of this period; many organisations in the Middle East have not operated as commercial companies because of various forms of government intervention and, in particular, locally based companies have been protected from international competition by government-imposed tariffs and trade barriers.

Due to the lack of resources, governments in developing countries are unable to provide good transportation and communication infrastructures. Roads, airports and ports tend to be poorly maintained with insufficient capacity to meet the necessary demands for the flow of materials and information (Gosen et al., 2005).

Abu-Hamattah et al., (2003) and Rawabdeh (2008) indicated that there is an award in Jordan called the *King Abdullah II Award for Excellence* presented by the government which enhances organisations to improve their performance by applying TQM programmes. The interest from society and governments in the development of quality has recently become manifested in different quality awards. It is evident that awards have encouraged companies to accept an increased societal responsibility (Hart and Bogan, 1992).

However, some researchers in the TQM area stated that there is a gap in quality management systems in ensuring that stakeholders and their contribution to product value is considered, evaluated and incorporated into the management process (Walker, 2000). Mele and Colurcio (2006) confirmed that in TQM literature there is a lack of studies analysing the contribution of quality management to value creation and diffusion in the perspective of stakeholders. Walker (2000) indicated that the question of developing effective measures of environmental performance is an important gap in the research that needs to be addressed. A number of gaps are identified in the literature on quality management in developing countries along with significant challenges, including differing perceptions of quality, the legacy of colonization and protectionist policies, and tight government controls (Gosen et al., 2005).

4.8 History of the development of quality management in Jordan

The Jordan Institution for Standards and Metrology (JISM) was established in 1972 and is considered as the first official Jordanian organisation interested in quality; basically, it focused on technical specifications relating to production and design. At the beginning of the 1990s JISM became the right hand of the government to ensure the quality and issued specifications and standards. Its objectives had been developed and it became an independent public institution in 1995 to conform to the developments that have taken place globally in the field of quality certification, standards and criteria (JISM, 2008).

JISM aims to ensure that the quality of local products through the adoption of appropriate specifications to achieve quality to the Jordanian products in order to compete in domestic and international markets. Also, it aims to build a national system of measurement and quality based on international practices it grants certificates and is a sign of quality with regional and international organisations with regard to the international certificates (JISM, 2008).

In the mid 1990s Jordanian private-sector became more interested in quality. Also, productive and service sectors started paying special attention to the application of global standards and trying to obtain international certificates in their field. However, pharmaceutical and printing companies were the first companies that obtained international certificates in quality management and quality standards (Rayyan and Tahboub, 1998; JISM, 2008).

“Enhancing Jordan Competitiveness: Quality, Productivity, Transparency and Accountability” was the first conference undertaking the quality issue at a national level conducted in 1997. It was organized and held by the Higher Council for Science and Technology (HCST) in 1997. In order to highlight the significance of the issue, the conference was held under the patronage of His Royal Highness Prince El-Hassan Bin Talal, the Crown Prince at that time.

Rayyan and Tahboub (1998) concluded that, in Jordan, industries were more familiar with ISO 9000 than TQM. Most organisations heard about TQM through ISO 9000 and they had difficulty distinguishing one from the other. Also, it is concluded that the electrical and pharmaceutical sectors were the only two sectors whose members are aware of TQM..

In the ICT sector, the standards of quality control in services have grown alongside the beginning of privatization of this sector. The Commission issued, in 2006, a regulatory framework for quality control in Jordan, the list of quality indicators and an explanatory memorandum to the regulatory framework for quality control in the ICT sector (JISM, 2008).

In 2000 the Jordanian government established the Jordan Institution for Standards and Metrology (JISM) in order to raise the quality of domestic products and, thus, improve their competitiveness in the national and global markets. As a regulatory entity JISM is

responsible for ensuring that the quality of domestic products complies with the latest worldwide standards. JISM is also responsible for establishing and implementing a national system of standardization and metrology based upon worldwide practices. In addition, it grants system conformity certificates and product quality marks. Last year, JISM introduced the Jordanian Quality Mark (JQM). The mark is awarded to domestic products after meeting certain requirements. Since then JQM was awarded to 64 products from 36 organisations (JISM, 2008).

In 2000, after entering Jordan in a series of international conventions, particularly the Convention on International Trade, both the public and private sectors became more interested in quality and its standards and criteria. The most recent government initiative to promote quality awareness amongst the Jordanian organisations was the introduction of Jordan Quality Award (JQA) in 2002. The title of the award was changed to King Abdullah II Award for Excellence (KAAE) (Rawabdeh, 2008).

This award is considered to be the highest level of quality and excellence recognition in Jordan. It aims at promoting quality awareness and performance excellence amongst Jordanian organisations and enhancing the competitiveness of Jordanian businesses (KACE, 2008). The KAAE is inspired by and similar to the MBNQA and the EQA. The three awards have the same five evaluation criteria. However, the KAAE surpasses the other two awards in its thoroughness in term of the sub-criteria levels (Rawabdeh, 2008). Applying the award's criteria is supposed to lead to achievement of total quality management (Abu-Hamattah, *et al*, 2003). The award is held every two years. Two awards are devoted to manufacturing organisations; one for large-size organisations and the other for SMEs.

The Award recipients are recognised as national role models. They also have special treatment and preference from the public organisations. For instance, their outcomes are given preference in government tenders and procurements, as long as they comply with

specifications. Furthermore, they are granted 25% and 50% discount of the involvement fees in the internal and external marketing exhibitions organized by the government, (KACE, 2008). Surprisingly, there is no established mechanism for evaluating whether KAAE has achieved its objectives or not. However, a recent study undertaken by Rawabdeh (2008) on KAAE winners revealed that the award did achieve its objectives. Winners reported that they gained internal and external benefits from winning the award. However, the study does not say which objectives have been achieved and to what extent. Moreover it does not identify the benefits gained by the award winners.

In spite of the lack of the resource of quality management efforts in Jordan it could be concluded that the interest in quality management started in the 1990s; for example, the conference that was conducted in 1997. On the other hand the TQM efforts and activities started after 2000 when the government established the Jordanian Institution for Standards and Metrology and established King Abdullah II Award for Excellence. The ICT sector was fully privatised after 2000 since then it has started to pay attention to TQM and ISO standards in order to improve its competitiveness and the quality of its services and products. Only in 2006 did ICT companies started implementing TQM and ISO standards formally (JISM, 2008; KACE, 2008).

4.9 Chapter summary

This chapter is an attempt to survey the literature on the most critical factors of TQM implementation often stressed by authors and researchers, supported by the writings of quality gurus. These are the factors that are included: leadership; quality communications and structure; employee empowerment and training; customer satisfaction; quality measurement and benchmarking; continuous improvement; organisational culture; quality information systems; policy and strategic planning; suppliers relationships. Moreover, it provides the result of TQM implementation in achieving companies' competitiveness. Also, the role of external environments,

governmental policy and social culture, in encouraging the management of TQM implementation is described. In addition, the researcher reviews the impediments that hamper TQM implementation in general and pays more attention to those in developing countries in particular.

The next chapter discusses the research methodology employed in the present research.

Chapter Five

Research Methodology

1.1 Introduction

Methodology refers to “*how research should be undertaken, including the theoretical and philosophical assumptions upon which research is based and the implications of these for the method or methods adopted*” (Saunders et al., 2007, p.481) It is concerned with the overall research process, from the theoretical underpinning to the collection and analysis of the data (Collis and Hussey 2003). Therefore, researchers should be careful when they choose the methodology which must be appropriate for the researcher’s objectives and questions. The nature of the research’s objectives and questions determine the design and strategy.

This chapter identifies the main research methods used in this study to assess the extent to which the Jordanian Information and Communications Technology (ICT) sector applies TQM to achieve that objective. The study combines two commonly used research methods: quantitative and qualitative method. In general, two methods are used to collect the data; namely, a survey questionnaire and semi-structured interviews. The questionnaire aims to investigate the implementation of TQM in the Jordanian ICT sector, while the interview method is mainly used to explain themes that have emerged from the use of a questionnaire. The two methods are viewed as complementary to each other, and the strengths and weaknesses of each method are also considered.

5.2 Research aims and objectives

The overall aim of this study is to investigate and subsequently to develop a model to help in the implementation of TQM in ICT companies in Jordan. In order to achieve this aim, five objectives are developed.

1. To assess the adoption of TQM factors in the Information and Communications Technology (ICT) Sector in Jordan. The factors of TQM included in the investigation are: top management commitment; quality communications and structure; employees empowerment and training; quality measurement and benchmarking; continuous improvement; customer focus and satisfaction; policy and strategic planning, organisational culture; quality information systems; suppliers relationships.
2. To explore the impact of TQM implementation on improving companies' competitiveness through profitability, service quality, effectiveness and market share.
3. To explore the role of environmental factors (government policy and social culture) in encouraging the implementation and sustainability of TQM in the Jordanian ICT sector.
4. To identify the main impediments of the adoption of TQM in the ICT sector in Jordan.
5. To propose practical suggestions and recommendation to support the adoption of TQM and tackle the problems and challenges which exist in the ICT sector in Jordan.

5.3 Research Questions

The research conducted will answer the following questions.

1. Which quality factors are critical for the effective implementation of TQM in the ICT sector in Jordan?
2. What is the impact of the TQM factors on improving the competitiveness of the ICT Sector in Jordan?
3. What is the role of the environmental factors in encouraging the implementation and sustaining of TQM in the Jordanian context?
4. What are the main impediments that prevent the adoption of TQM in the ICT sector in Jordan?

5.4 Research design

Research design is the structure which is considered very important to both data collection and analysis. It is the plan for achieving the aims and objectives of the investigation. Oppenheim (1992) pointed out that the term research design refers to a basic plan or strategy of research and the logic behind it, which will make it possible and valid to draw more general conclusions from it. Kumar (1999) defined research design as a procedural plan that is adopted by the researcher to answer question validity objectively, accurately and economically.

Understanding the philosophical issues of research design is of crucial importance for three reasons. Firstly, knowledge of research design philosophy can enable the researcher to clarify the research design, which provides important insights into what kind of evidence is required and how it is to be gathered, as well as providing answers to the basic questions being investigated in the research. Secondly, knowledge of research design philosophy can help the researcher to recognise which research designs might work and which might not. For example, if you are particularly interested in understanding why something happens rather than being able to describe what it is, it may be more appropriate to adopt an inductive approach than a deductive, and thirdly, knowledge of research design philosophy can help the researcher to identify, and even create, a research design which may be outside the researcher's past experience (Easterby-Smith et al., 2002).

Saunders et al. (2007) mentioned that it is important to have a clear research strategy (design), a general plan of how the researcher will go about answering the research questions. Research strategy should contain clear objectives derived from the research questions; also, it should identify the sources from which the researcher intends to collect data. Sekaran (2003) pointed out that research design involves a series of rational

decisions. These are: identifying the purpose of the study, whether it is exploratory, descriptive or hypothesis testing; identifying the type of investigation; deciding the extent of the researcher's intervention; identifying the study setting; deciding measurement and measures; deciding data analysis; deciding data collection methods; deciding time horizon; deciding sampling design; identifying the unit of analysis.

Accordingly, the choice of research design depends on the research questions, objectives and research philosophy. More details about the chosen research design and rational reasons behind that choice will be discussed in the following subsection.

5.5 Research philosophy

The concept of the paradigm is essential to the research process in all areas of study. A paradigm is a very broad conception of the nature of scientific endeavour within which a given enquiry is undertaken (Mangan, 2004). Gummesson (2000, p. 18) remarked that the paradigm concept was brought to the fore by Thomas Kuhn, at the beginning 1960s, and can be used to signify “*people's value judgements, norms, standards, frames of reference, perspectives, ideologies, myths, theories, and approved procedures that govern their thinking and action*”. A research paradigm is the underlying set of beliefs about how the elements of the research area fit together and how people can enquire of it and make meaning of their discoveries (Wisker, 2001). Research philosophy or paradigm refers to the way the researcher thinks about the development of knowledge (Saunders et al., 2003).

There are two research philosophies that dominate the literature in business and management research: positivism and phenomenology (Collis and Hussey, 2003). The philosophical level of a research method relates to its assumptions based on the most general character of the world, encompassing such aspects as mind, matter, reality, reason, truth, nature of knowledge, and proof of knowledge (Hughes, 1994). Shih (1998)

mentioned that there are four areas for thought when deciding on a research method: the philosophical paradigm and objective of the research; the nature of the phenomenon of interest; the level and nature of the research questions, and practical considerations related to the research environment; the efficient use of resources.

Positivist philosophy adopts the stance that the researcher will operate distantly from the social world and that evaluation of phenomena identified will be approached through objective methodologies. The positivist understanding and trust of data relies upon the removal of the idiosyncrasies of the phenomenon under examination to consider what is, in general, applicable. This approach is predisposed towards the use of questionnaires for collecting data and analytical statistical analysis such as hypothesis testing, random sampling, aggregation, precision and measurement (Stiles, 2003).

The phenomenological school believes that the world is socially constructed from the understanding of people within it. It is, consequently, highly dependent upon the subjective understanding of information available. The epistemological base for this view is that knowledge “comes from human experience, which is inherently continuous and non-logical, and which may be symbolically representable” (Evered and Louis, 1991). With this approach the researcher attempts to develop a symbiotic association with their environment and to consider and re-evaluate their findings according to the information received. As a result, advocates of phenomenology tend to draw upon methods that develop meaning from the point of view of the participant and in general favour a more qualitative approach to data collection and explanation (Stiles, 2003). However, Easterby-Smith et al. (2002) distinguished between them, as shown in table 5:1.

Table 5.1 Contrasting implications of positivism and social constructionism

	Positivism	Social constructionism
The observer	Must be independent	Is part of what is being observed
Human interests	Should be irrelevant	Are the main drivers of science
Explanations	Must demonstrate causality	Aim to increase general understanding of the situation
Research progress through	Hypotheses and deductions	Gathering rich data from which ideas are induced
Concepts	Need to be operationalised so that they can be measured	Should incorporate stakeholder perspectives
Unit of analysis	Should be reduced to simplest terms	May include the complexity of whole situations
Generalisation through	Statistical probability	Theoretical abstraction
Sampling requires	Large number selected randomly	Small number of cases chosen for specific reasons

Source: Developed from Easterby-Smith et al. (2002).

As shown in table 5:1, the fundamental idea of positivism is that the social world exists externally and that its properties may be measured by using objective methods rather than being inferred subjectively by using observation or intuition (Easterby-Smith et al. 2002). According to Gill and Johnson (2002) and Collis and Hussey (2003), this philosophy is characterised by five distinguishing features: it is deductive (theory tested by observation); it seeks to explain causal relationships between variables; it frequently utilises quantitative data; it employs controls to allow the testing of hypotheses; it uses a structured methodology to facilitate replication.

The social sciences, which had initially adopted positivism as they were emerging towards the end of the nineteenth century, transferred towards the phenomenological paradigm. This transferring from positivism towards phenomenology was also evident in much business research, but in latest decades there has been a move among researchers to develop methods and approaches called triangulation which provide a middle ground

and some bridging between the two schools' viewpoints (Easterby-Smith et al., 1991). In accordance with Ticehurst and Veal (2000), triangulation gets its name from the land surveying method of fixing the position of an object by measuring it from two different positions.

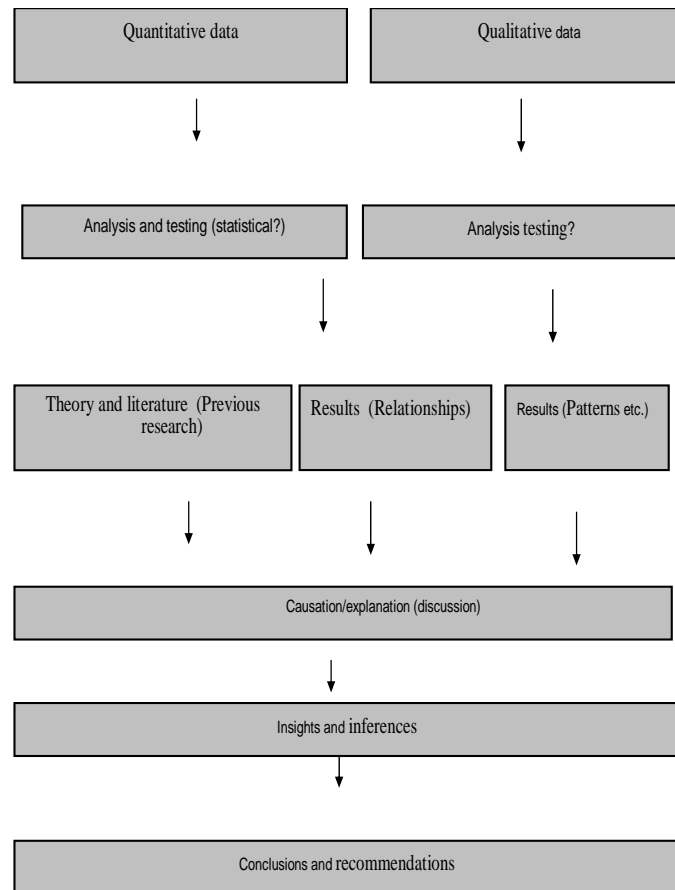
Hussey and Hussey (1997) stated that the use of diverse research approaches, methods and techniques in one study is known as triangulation and such triangulation can overcome the potential bias and sterility of single method approaches.

Quantitative and qualitative methodologies are usually connected, respectively, with the two principal research paradigms which are generally labelled positivism and phenomenology (Mangan, 2004). Quantitative data can assist with the qualitative side of a study during design by finding a representative sample and locating deviant samples, while qualitative data can assist the quantitative side of the study during design by aiding with conceptual expansion and instrumentation (Amaratunga et al., 2002). If such relationships are determined, then quantitative methods are weaker in providing clarification. Qualitative methods may help in understanding the underlying explanations of significance (Jones, 1997). Rossman and Wilson (1991) answered the question why link qualitative and quantitative data and considered it to be:

- to enable confirmation or corroboration of each other via triangulation;
- to elaborate or develop analysis, providing richer details;
- to initiate new lines of thinking through attention to surprises or paradoxes, “turning ideas around” providing fresh insights.

In general it denotes a reference to a mixture of research methods- thus the use of qualitative and quantitative technique together in same study- which is very powerful in acquiring insights and results, for making inferences and in drawing conclusions, as shown in figures 5.1

Figure 5.1 Triangulation of qualitative data



Source: (Fellows and Liu, 1997).

The rationale behind this combination is that each philosophy has strengths and weaknesses (see table 5:2) and using a combination would maximise their strengths and minimise their weaknesses.

Triangulation is a research strategy whereby several techniques are employed to provide validation of data or the results of analysis. In this research project triangulation is achieved by the use of Primary methods: questionnaires and semi-structured interviews and secondary methods: of literature review and soliciting expert opinion

Triangulation can also be used to enhance the effectiveness of research methods. Bryman suggests that triangulation could be understood as is a concept of combining different methodological techniques to overcome weaknesses in specific techniques. Traditional methods based on the positivism paradigm will not necessarily yield the result that the researcher expects or wants. Human beings are not static, and research methods used should therefore be able to accommodate social interaction and dynamism (Bryman, 1988).

Table 5.2 The strengths and weaknesses of research philosophies

Strengths	Weaknesses
Positivist	
Have a wider range of situations; faster and more economic than phenomenological approaches	Inflexible and artificial in understanding processes or the significance that people attach to actions, they are not helpful in generating theories
Phenomenological	
Have the ability to understand the people's interpretations	Time-consuming Costly Difficulty in analysing and interpreting data
Generate new theories	
Provide more depth to research being investigated	

Creswell (1998); Easterby-Smith et al. (2001) and Collis and Hussey (2003).

As shown in table 5:2, the strengths of positivism philosophy are that it has a wider range of situations, more economic and faster, while the strengths of phenomenology are the ability to understanding people's explanations; it also has the ability to create new theories and support more depth to the investigation. On the other hand, the weaknesses of positivism are inflexible and artificial in understanding processes and people attach it to actions; it is not useful in generating theories. However, the weaknesses of

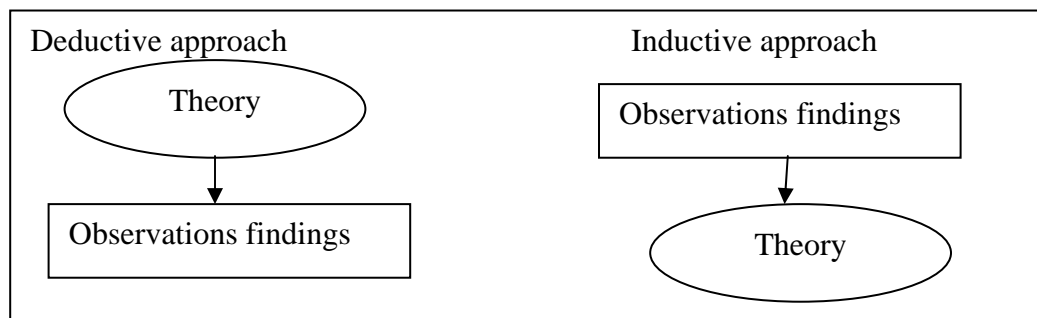
phenomenology are that it is time-consuming, often not an economic option, analysis and explanation is difficult.

5.6 Research Approach

There are two approaches to research: deduction and induction (Saunders et al., 2007). These two approaches outline the nature of the relationship between theory and research (Anderson, 2004; Bryaman, 2004; Collis and Hussey, 2003). According to the deductive approach, researchers deduce their studies' hypotheses based on known facts (theories), translate them into operational terms and test them in empirical ways by using statistical methods (Bryaman, 2004, Sunders et al, 2007). Therefore, the deductive approach helps in confirming, modifying, or rejecting theories from which hypotheses were deduced.

The deductive approach involves moving from the general (theoretical position) to the specific (inquiry of the research). The inductive approach starts from a set of observations to build a theory. Theory is generated through establishing general propositions about the nature of what has been observed over a period of time (Anderson, 2004). Generally, the inductive approach involves moving from the specific to the general. Figure 5.2 show the two approaches.

Figure 5.2 Deductive and inductive approaches to the relationship between theory and research



Source: Bryaman, (2004, p. 10)

Creswell (2003) suggested three practical criteria in choosing a research approach: a) the nature of the research topic, b) the available time the researcher has and c) the extent to which the researcher is prepared to indulge risk. Taking these criteria into account, this research is mainly deductive despite being based on multiple methods of primary data collection. The reasons behind this choice are now given.

1. The literature of TQM enables the researcher to define a theoretical framework and develop hypotheses, as suggested by (Sekaran, 2003), which lend themselves more readily to the deductive approach.
2. Generalisation: a quantitative survey approach seeks to identify relationships that are common across individuals and organisations and, hence, provide a general statement or theory about the phenomenon being researched (Creswell, 2003).
3. Saving in time and effort: adopting a cross-sectional survey methodology leads to saving time, effort and resources required in comparison with longitudinal methodologies (Creswell, 2003).
4. Causality: quantitative research is concerned with establishing a causal relationship between variables (Clifford and Valentine, 2004).

5.7 Research strategy

Research strategy is a “general plan of how the researcher will go about answering the research question(s)” (Saunders et al. 2007., p.610). Saunders et al. classified research strategies into six categories: experiment; survey; case study; grounded theory; ethnography, and action research. In this research a survey strategy was employed. Hair et al (2003) identified survey as a strategy used to collect primary data from individuals. The data sought can range from beliefs, opinions, attitudes and lifestyles to general background information on individuals, such as gender, age, education and income, as well as company characteristics like revenue and number of employees (Hair et al 2003).

Survey strategy involves the structured collection of data from a sizable population (Saunders et al. 2007).

The main criterion for choosing a particular strategy is the approach adopted in undertaking the research (Creswell, 1998) which, in turn, depends on research objectives. According to Collis and Hussey (2003), adopting the deductive approach leads the researcher to employ experimental or survey strategies. In contrast, adopting an inductive approach leads the researcher to employ the strategies of case study, grounded theory and action research. The rationale behind this choice is:

1. it is consistent with the research approach in that it is usually associated with the deductive approach and is the most popular and commonly used strategy in business or management research (Saunders et al. 2003)
2. the data collected from the survey is standardised allowing easy comparison and statistical analysis (Saunders et al. 2003)
3. the survey allows for the collection of a certain amount of data from a sizeable population in a highly economical way (Leedy and Ormrod 2001)
4. the survey allows a significant degree of control over the research process and it is easy to undertake (Sekaran 2003).

5.8 Time horizon

Sekaran (2003) classified research into cross-sectional versus longitudinal studies. A cross-sectional study is one of a particular phenomenon (or phenomena) at a particular time, while a longitudinal study involves a survey, is a fixed sample, which is measured repeatedly. The choice of which one of these types to be undertaken is influenced by three factors; purpose of research, research strategy (Churchill, 2001) and time available for the researcher (Saunders et al., 2003). Taking these criteria into account, a cross-sectional research was chosen for this research, for the following reasons:

1. it is a common method of descriptive research in business studies (Churchill, 2001)
2. it is the most common method of survey research (Churchill, 2001), because a survey strategy requires collecting data from a sizable population in a particular time (Leedy and Ormrod, 2001)
3. it is appropriate for most research projects undertaken for academic courses because research projects are time constrained (Saunders et al. 2007). Using this method, a study is carried out just once, over a short period of time, to collect information from a large number of people or companies (Hussey and Hussey, 1997).

5.9 Data collection methods

Oppenheim (1992) defines research methods as those used for data collection and generation. There are two methods of data collection that can be used by any business research: secondary and primary. Secondary data collection methods are all sources that are available to a researcher in order to obtain the necessary information for a research problem. Using the typology put by Saunders et al. (2007), secondary data can be categorised as documentary versus survey. Documentary data include written (e.g. books journals, reports) and non-written (e.g. television programme and CD-ROM).

Primary data collection on the other hand, includes two main methods: questionnaires and interviews. As suggested by Silverman (2001), these methods must be understood in both approaches: quantitative and qualitative. Researchers who use a quantitative approach collect their data by using predetermined instruments, such as questionnaires that yield statistical data, while others who use a qualitative approach can collect data by words and observations.

According to Saunders et al. (2000), Easterby-Smith et al., (2002) and Creswell (2003), in reality, business research rarely falls under one specific research philosophy,

positivism (quantitative) or phenomenology (qualitative). Most management and business research uses a combination of both of them. Based on this debate, the rationale behind choosing a multi-method approach to research is now given.

1. Describing TQM application to the ICT sector in Jordan requires a questionnaire, while understanding practices requires flexible personal interviews with a limited number of respondents.
2. The choice of multi-methods of data collection enables triangulation to take place (Leedy and Ormrod, 2001). Triangulation, according Saunders et al. (2003), is *“the use of two or more independent sources of data or data collection methods within one study in order to help ensure that data are telling you what you think they are telling you”*. According to Creswell (2003), triangulation can achieve three advantages: it provides a kind of convergence of findings; it provides complementary between facts; it adds scope and breadth to a study.
3. Semi-structured interviews can be a valuable way of triangulating data collected by other means, such as a questionnaire (Saunders et al., 2007).

5.9.1 Questionnaires

Questionnaire can be defined as *“a reformulated written set of questions to which respondents record their answers, usually within rather closely defined alternatives”* (Sekaran, 2003: p.236). Ghauri et al. (1995) stressed that questionnaires are the most popular data collection method in business studies. Furthermore, Bryman (2004) stated that the questionnaire method will probably be the most appropriate form of gathering information from both staff and managers.

Saunders et al. (2007) classified a questionnaire according to how it is administered as either self-administered or interviewer-administered. Self-administered questionnaires are usually completed by the respondents. Such questionnaires are delivered and

returned electronically (on-line questionnaires), posted to respondents who return them by post after completion (postal or mail questionnaires), or delivered by hand to each respondent and collected later (delivery and collection questionnaires). Responses to interviewer-administered questionnaires, which include telephone questionnaires and structured interviews, are recorded by the interviewer on the basis of each respondent's answer. One drawback of interviewer-administered questionnaires is the difficulty in finding a suitable time for respondents.

According to Oppenheim (2000), the choice of the type of questionnaires can be influenced by three factors; research strategy; time taken to complete collection; size of sample and likely response rate characteristics of respondents. For this research self-administered questionnaires are more preferable than interviewer-administered questionnaires for the following reasons.

- a) It is the most common and popular method of primary data collection used in quality management surveys.
- b) The interviewer-administered questionnaires are more time consuming than self-administered questionnaires (Sekaran 2003).
- c) The self-administered questionnaires can yield more advantages over interviewer-administered questionnaires in that they ensure a minimum of interviewer bias (Oppenheim 2000).

For this research the delivery and collection questionnaire is chosen as the main data collection method. The rationale behind this choice is threefold.

1. The use of on-line questionnaires requires respondents to have web sites or known e-mails, a condition that cannot be guaranteed in the case of Jordanian companies. As a result, this type cannot be used.
2. The use of postal (mail) questionnaires has little control in securing a response from specific respondents and cannot control the speed of responses (Churchill

2001), while delivery and collection questionnaires ensure a high response rate and accurate sampling (Oppenheim 2000).

3. According to Sekaran (2003) there are a number of advantages in using the self-administered questionnaires. All the completed responses can be collected within a short period of time and a good rapport can be established to motivate respondents; there is an opportunity to introduce the research topic and motivate the respondents to give their answers honestly; any doubt or misunderstanding about the questionnaire will be clarified; it is less expensive when distributed to group of respondents; it gains an almost 100% response rate.

5.9.1.1 Questionnaire sample

Population refers to the group of individuals, events, organisations, or things that the researcher is interested in investigating (Cavana *et al.*, 2001; Collis and Hussey, 2003). The population for this research consists of 30 companies in the ICT sector in Jordan that are licensed to work and are registered within the Telecommunications Regulatory Commission (TRC). The researcher targeted 27 companies to conduct the study and three companies to pilot the questionnaire. A personal visit was made to the Telecommunications Regulator Commission and the Amman Financial Market in Jordan to get the organisations' addresses that were licensed and listed. The rationale for such a 100 percent sample is supported by Gay (1996) who argued that, for small populations ($N < 100$), there is little point in sampling so that the researchers need to survey the entire population. Furthermore, the technique is consistent with the research objectives in that "*statistical analysis usually requires a minimum sample size of 30*" (Saunders *et al.*, 2003, p. 178).

The researcher targeted General managers; TQM managers and TQM employees to collect the data by questionnaire. The reasons behind that are now given.

1. In the organisational setting the opinions of leaders who are very knowledgeable are included in the sample. Enlightened opinions, views and knowledge constitute a rich data source (Sekaran, 2003).
2. General managers, who are found in the headquarters of each companies, are the most knowledgeable people in terms of quality management practise, policies, process, strategic planning, implementation, evaluation, training issues and all the factors and barriers that could effect TQM effectiveness.
3. TQM managers are considered by many researchers in the field of TQM as being the most important group in the company to secure the success for TQM functions; their support, commitment, opinions and attitudes towards the importance of TQM functions in the company decide the success of these functions.
4. TQM employees are included because the study has a comprehensive questionnaire that includes many questions relating to TQM problems and many other issues. The required information or answers need to be obtained from the people who have them, the people who are in charge of TQM; they know better than any other people, they are the only people who can answer all the questions. Such information contains specific issues and is not available from all the people in the company.

The categorisation of these companies according to Telecommunications Regulatory Commission report (2006), is:

- 17 data communications companies
- 1 land telephone company
- 3 cellular companies
- 4 pre-paid card companies
- 1 radio trunking company
- 1 paging company
- 3 satellite companies.

5.9.1.2 Developing questionnaire

The questionnaire should be designed carefully and clearly worded, avoiding slang and using a rating system specifying their use and purpose, to extract the necessary information (Oppenheim, 2000). Therefore, the researcher should design the questionnaire in a way that helps to achieve the objectives of the research and answers its questions. According to Sekaran (2003), questionnaire design should focus on three areas:

1. questionnaire wording ,
2. measurement principle,
3. questionnaire layout.

5.9.1.3 Questionnaire wording

Question wording is considered an important issue in questionnaire design. Based on guidelines suggested by Oppenheim (2000), Aaker et al. (2001), Churchill (2001), Easterby-Smith et al. (2002), Malhotra and Birks (2003) and Sekaran (2003), the following issues must be taken into account when wording the questions :

1. use simple, direct and familiar language in wording the questions in which jargon, abbreviations and technical terms should be avoided
2. keep each question as short as possible in a way that would not affect the content and the intended meaning of the question
3. avoid double-barrelled questions and double-negative questions.

On the other hand, there is an important guideline related to question wording which is whether open or closed-ended questions are used. Dillman (2000) mentioned that there are two types of questions that can be used in designing a questionnaire: open-ended (unstructured) and closed-ended (structured) questions. Table 5:3 below shows the advantages and disadvantages of using open-ended and closed-ended questions. Open-ended questions allow the respondents to give the answer freely and compose their ideas in their own language. However, it consumes the time of the respondents and requires

more effort, while the advantages of closed-ended questions are that they save time and the responses are easier to compare as they have been predetermined. However, this kind of question does not allow the respondents to compose their answers and ideas.

Table 5.3 Advantages and disadvantages of open-ended and closed-ended questions

Advantages	Disadvantages
Open-ended questions	
Option to answer freely and opportunity to probe responses	Time-consuming and demand more effort from respondents
Closed –ended questions	
Require little time Responses are easier to compare as responses have been predetermined	Do not allow probing responses

Source: Outlined from Oppenheim (2000) and Saunders et al. (2007).

Taking account of the advantages and disadvantages of closed and open-ended questions, the researcher has adopted closed questions in designing the questionnaire. Some open-ended questions in the form of ‘others (please specify), were used. The rationale behind closed-ended questions in the research questionnaire is twofold:

1. some respondents of the questionnaire are general and TQM managers, who are known to be busy so that using many open-ended questions would reduce the response rate of the questionnaire

2. the questionnaire distribution is followed by a number of interviews, which would capture any ideas that could not be captured in the questionnaire.

5.9.1.4 Measurement scales

Based on Cooper and Schindler (2001), there are three types of scales used in business and management research: categorisation, ranking and ordering. Choosing the most suitable scale depends on the type of data required. The different scaling helps the researcher choose the suitable scale for his study (Sekaran, 2003). All these measurement scales were used in this study. A classification of scales was formulated by Stevens (1946) and is commonly used today (Rosser, 1983, p. 35)

- The nominal scale can be a narrative description or personal impression (WHO, 1979, p. 18). Nominal scales do not imply a ranking or ordering, but are an indication that given events or issues are either equivalent to, or different from, other events or issues (Krauth, 1988).
- The ordinal scale orders and ranks one element against another. For example, the height of a person may be described as “tall” (descriptive) or relatively “less tall” than another person. An ordinal scale does not imply equal distance between the points on a scale, but does suggest that there is significance to the order given.
- The interval scale describes equal distance between points, but does not have a fixed zero. The points on a Likert scale may in some cases approximate interval measures.
- The ratio scale has equal distances between points with a fixed zero. A person’s age in years or height in inches is a ratio measure. Using this scale enables the researcher to measure values exactly and apply wider statistical techniques than those available for ordinal variables.

In the present research a ratio scale is used in part one in order to obtain information regarding respondents' and their companies' characteristics, such as number of employees. In a ratio scale a value of zero indicates a total absence, ratios of numbers on the scale reflect ratios of magnitude for the variable being measured. That is, a ratio scale not only allows for measuring the differentiation between two subjects, but also allows for describing the differentiation in terms of ratio.

The ranking scale is used when the respondents are required to provide responses in the form of a rank ordering according to some criterion, such as preference, age, income group, importance, etc (Hair et al, 2003). In this research the ranking scale was used in part 5 of the questionnaire which aims to identify the most common impediments to the adoption of TQM in the ICT sector.

A five point Likert ordinal scale was employed throughout the questionnaire in order to indicate the degree of agreement or disagreement with each statement included in the questionnaire. The type of Likert scale which was used in this research was 1) strongly disagree, 2) disagree, 3) not sure, 4) agree, 5) strongly agree. This scale was used in parts 2; 3 and 4. The rationale behind the choice of the five-point Likert Scale within this study are:

1. it helps respondents to make good judgements and provides them with some degree of flexibility of choice to reflect the intensity of respondents' views
2. it does not confuse the respondents with having many choices on its continuum scale; Hussey and Hussey (1997) indicated that it makes the respondents comfortable with a wide range of choices on its continuum scale and that it is easy for respondents to complete
3. it allows the researcher to have several statistical techniques and to conduct a powerful statistical analysis; the five-point Likert scale helps the researcher in coding and analysing the data (Hussey and Hussey, 1997).

4. many research studies in the field of TQM used five-point Likert scale (such Chapman and AL-Khawaldeh, 2002; Temtime and Solomon, 2002; Solis et al, 1998).

5.9.1.5 Questionnaire layout

Based on Saunders et al. (2003), layout is a very important issue for questionnaire design. It must be designed in such a way that makes it easy to read and complete. In order to encourage the respondents to fill in and return the questionnaire, the layout must be attractive and not too long. The length of the self-administered questionnaire of between four and eight A4 pages is acceptable (Saunders et. al., 2007). Moreover the introduction must be clear and explain the research objectives and provide a way for answering each part without difficulties. Following the guidelines by Oppenheim (2000) and Sekaran (2003), the following issues were given specialist attention in the questionnaire layout:

1. the sequence of questions was arranged from general to more specific questions which make the questionnaire as easy as possible for the respondents;
2. a special attention was given to emphasise the confidentiality; all respondents will be treated with the utmost confidence and results will be used for research purposes only;
3. the respondents were provided two covering letters: one from the researcher's director of study in English and the other in Arabic from Al Hussein Bin Talal University in Jordan (researcher's sponsor). The covering letter was used to (Oppenheim, 1992; Saunders et al., 2003):
 - a. access the companies
 - b. encourage respondents to participate in the research
 - c. explain the purpose of the research
 - d. ensure that the data provided by respondents will be treated in high confidentiality.

5.9.1.6 Translation of the research questionnaire

Although English is widely spoken in the business sector in Jordan, the decision was made to translate the research questionnaire into Arabic, the official language in Jordan, in order to make it very clear for the respondents. Originally the questionnaire was designed in English in the UK (see Appendix A) and translated into Arabic in Jordan. It was decided to distribute the questionnaire in both English and Arabic; the reasons being that some respondents prefer to answer the English copy.

Based on Saunders et al. (2007), there are four techniques can be used in the process of the questionnaire translation: direct translation, back translation, parallel translation and mixed techniques. The technique which was adopted for the translation of this research questionnaire was the parallel method.

The process of this technique is that the source questionnaire is translated by two or more independent translators. Two translated questionnaires are compared and then the final version is created.

5.9.1.7 The contents of the questionnaire

The final version of the questionnaire includes five main parts. Part one aims to obtain a general background of the respondents and the companies' characteristics. The information obtained was used to achieve the research objectives by exploring the correlation between the companies-specific characteristics and the effective applying of TQM. In this part, information about respondents characteristics is required: gender, age, educational level, work experience in the field of TQM, job titles Information about the companies' characteristics is required: company ownership, current market region, number of employees, business types company, company standardisation.

Part two includes thirty eight statements to assess the adoption of TQM factors: top management commitment; quality communications and structure; employee improvement; quality measurement and benchmarking; continuous improvement; customer focus and satisfaction; organisational culture; quality information systems; policy and strategic planning; suppliers' relationship.

Part three includes twelve statements describing the companies' competitiveness through measuring the profitability, quality service, effectiveness and market share.

Part four includes six statements about the role which external environmental factors play in encouraging TQM implementation and sustainability.

Part five includes ten factors which represent the barriers to the successful adoption of TQM in order to identify the most effective factors.

5.9.1.8 Piloting the questionnaire

Questionnaire piloting is considered an important issue in research. Malhotra and Birks (2003) strongly recommended that, prior to using a questionnaire to collect data, it should be pilot tested. Saunders et al.,(2007: p.386) stated that:

“The purpose of the pilot test is to refine the questionnaire so that respondents will have no problems in answering the questions and there will be no problems in recording the data. In addition, it will enable you to obtain some assessment of the questions' validity and likely reliability of the data that will be collected”.

In this research the pilot study was conducted in three stages. The first draft of the questionnaire was considered by four particular colleagues who are doing PhD research in TQM and management in Huddersfield University and other UK universities. They provided the researcher with suggestions about question wording, design, layout and question content. These suggestions were taken into account in the process of generating the second draft.

At the second stage the pilot questionnaire was distributed to six of the academic staff who are experts and specialised in TQM and management in the UK (four academic staff in four different universities) and two in Jordanian universities. They gave their comments on the content and structure of the questionnaire and provided the researcher with useful comments.

At the third stage of the pilot nine questionnaires were sent to three companies to be completed by General and TQM managers and TQM employees in both English and Arabic; this stage aimed to establish whether there were any ambiguous or misunderstood questions or suggestions. Six of the questionnaires were completed and collected by the researcher. None of the respondents recommended any alterations, which meant that the questionnaire was clear and easy to complete. To this end, as suggested by Oppenheim (2000), no additional pilot test was required; hence the final two-language version of the research questionnaire was ready for conducting the study.

During the development of the project, and after its completion, the research was discussed with, and opinion sought from, several experienced academic and commercial consultants. Their input was very valuable in developing the questionnaire and in interpreting the results. Significant input then came when attending an international TQM conference. Many noted authors, practitioners and associates attended the conference. The researcher had the opportunity to discuss the paper which emerged from the research objectives, methodology and results. The discussions provided valuable feedback to the researcher when preparing his thesis.

5.9.1.9 Response rate

The sample targeted the entire population because the research is small, as mentioned before. The questionnaire was distributed to twenty-seven information and communications technology companies. A total of 120 questionnaires were distributed

personally by hand, of which 88 were returned completed and usable, while five questionnaires were ineligible.

The response rate was 80.9% which is considered a good rate compared with other research in the same field. According to Saunders et al, (2007), calculating the response rate can be executed by using the following formula:

$$\begin{aligned} \text{Total response rate} &= \frac{\text{Total number of responses}}{\text{Total number in sample} - \text{Ineligible}} \\ &= \frac{93}{120 - 5} = 80.9 \% \end{aligned}$$

This formula shows that the responds rate was adequate and high. The researcher gained this rate in accordance to the following recommendations which have been found by Oppenheim (1992) to increase the response rate:

- advance warning : informing the respondents of the study in advance ;
- explanation of selection : explaining the method of sampling used;
- confidentiality : assuring respondents that all information will be treated with total confidentiality;
- incentives to the respondents.

Much much effort was made in order to maximise the response rate. The following of procedures were taken to increase the response rate.

- The researcher delivered and collected the questionnaires by himself to save participants' time and cost.
- A covering letter accompanied the questionnaire that incorporated the objectives of the research and conveyed the importance of responding for the success of the study.

- All the information provided by the participants and their answers was treated in confidence and did not mention their names or companies in the written documentation.
- All the participants were given the right to withdraw from the research at anytime they wished to.
- Telephone calls, whenever possible, were conducted to invite participation and remind the respondents to answer the questionnaire.
- The researcher explained the importance of his study to the ICT companies and how it could help in improving their business.
- The questionnaire was short and easy to complete.

5.9.2 Semi-structured interviews

The interviews for this research were the second data collection method. According to Sekaran (2003), one method of collecting data is to interview respondents in order to obtain information on the issue of interest. Hussey and Hussey (1997) defined an interview as a method of collecting data in which participants are asked questions in order to find out what they do, think or feel.

Saunders et al. (2007) suggested three categories of interviews: structured, semi-structured and unstructured.

Structured interviews are used in descriptive studies to obtain quantitative data whereby the researcher uses questionnaires based on a predetermined and standardised or identical set of questions. The researcher reads out each question and then records the response on a standardised schedule, usually with pre-coded answers.

Semi-structured interviews are non-standardised and used in explanatory studies whereby the researcher has a list of themes and questions to be covered, although these interviews may vary from interview to interview.

Unstructured interviews (also called in-depth interviews) are used in exploratory studies to explore in depth a general and/or new area in which the researcher is interested.

The use of the interview as a data collecting method has many advantages.

1. The use of the interviews increase the certainty. Due to the direct contact between the interviewer and interviewee it allows the researcher to explain the purpose of the study more freely and to clarify any doubt or to avoid any misunderstanding of the questions or the concepts (Oppenheim, 1992).
2. It allows the researcher to ask more complex questions and to ask follow-up questions not possible in the questionnaire. Moreover, it takes into account the non-verbal communication, such as the feeling, behaviour, attitudes and facial expression of the interviewee. Thus, it may allow a higher degree of confidence in the replies than questionnaire responses (Hussey and Hussey, 1997).

According to Leedy and Ormrod (2001), the use of a particular type of interview as a data collection method depends on the research objectives. For this research semi-structured interviews were used. Based on Saunders et al. (2007), semi-structured interviews can be used to explore and explain themes that have emerged from the use of a questionnaire. They added that “*semi structure interviews are used not only to reveal and understand what and the how but, also, to place more emphasis on exploring the why*”.

In this research, interviews have the highest degree of flexibility among qualitative methods and are able to reach the specified managers more effectively than the survey approach (Leedy and Ormrod 2001). In addition, semi-structured interviews are strongly recommended as a means of validating findings from the use of a questionnaire (Wass and Wells, 1994).

In addition many Arab researchers have recommended the use of the face-to-face semi-structured interviews technique as a means of data collection, in addition to a survey questionnaire, to conduct their research (Al-Bahusseini, 2000; Al-Rashed, 1996). They

concluded that this technique is very successful in Arab companies where managers prefer to talk rather than to complete a questionnaire.

5.9.2.1 Semi-structured interviews sample

The sample of interviews chosen were related to four broad decision areas: deciding on a suitable sample size; identifying a suitable sampling frame; selecting the most appropriate sampling technique; choosing the respondents within each company. Regarding the first of these decision areas the sample size can be determined by the research questions and /or objectives (Saunders et al., 2003) and the researcher's available time and budget (Lee, 1999). Taking these determinants into account, ten companies were targeted for semi-structured interviews. The rationale for targeting ten companies is:

- a) semi-structured interviews were used to explain themes that emerged from the use of a questionnaire; because there was no intention to analyse qualitative data statistically; therefore, there was no need to have a sample size of more than thirty, the minimum sample size required to conduct statistical analysis (as suggested by Saunders et al.2007)
- b) in terms of cost and time, the researcher had limited resources and tight deadlines as he was sponsored for three years to complete this research (Lee, 1998).

The second decision area is identifying a suitable sampling frame. The researcher drew the sample from ten companies for interviews from those who participated (N=88) rather than from the whole study population (N=120).

Selecting the most appropriate sampling technique is the third decision area. According to Hair et al., (2003), the selection of which sampling technique to use in the research depends on the sampling frame and objectives. Therefore, the researcher chose the ten largest companies based on the number of employees to conduct the semi-structured

interviews. These ten companies have TQM departments, which means that they are able to provide more detailed information about TQM issues in their companies.

The fourth decision area is choosing the respondents within each company. The interviews were held with General and TQM managers who had filled in the questionnaire. The main reason for targeting these managers is to have valid findings, since the interviewees were required to explain their responses to the questionnaire.

The researcher conducted three informal interviews with three managers in order to pilot the interview questions. Based on those pre-interviews the researcher justified some questions according to the recommendations suggested by the interviewees. The researcher ended with a list of questions suitable for asking among the interviews (see appendix B).

As mentioned in chapter four, customer satisfaction is a critical factor for judging the effectiveness of TQM implementation. In order to obtain clear and concise information regarding customer satisfaction and the performance and services provided by the ICT companies used in the study the researcher conducted a set of semi-structured interviews with a sample of regular customers of the ten largest companies.

Because there are geographical and legal limitations which prohibit the identification and locations of customer the researcher targeted customers groups within central government ministries in the capital Amman. The researcher targeted the largest group of customers in each company. A total of 45 regular customers of the ten largest companies in the Jordanian ICT sector were interviewed.

Two questions were prepared and each interviewee was asked to answer the questions; “Could you please tell me about service quality of your network?” “Do you focus on service quality or price when you contract to your supplier? At the end of each interview all the participants were asked if they would like to comment further e.g. concerning their supplier or the industry in general.

5.10 Validity and reliability evaluation

Validity and reliability are the important criteria for evaluating the accuracy and precision of these research findings. In this research a two methods approach was used: personally-administrated and semi-structured interviews. The researcher used many procedures before, during and after collecting the data, in order to ensure validity and reliability of the research findings.

Validity

Validity is considered as the degree to which a means measures what it is supposed or intended to measure (Oppenheim, 1992). According to Hussey and Hussey (1997) validity is the extent to which the research findings accurately represent what is really happening in the situation. Validity can be classified into two parts: external validity and internal validity (Creswell, 2003). External validity refers to the ability of the researcher to draw correct inferences from the sample to other people, other settings and past or future situations. He defines internal validity as the ability of the researcher to draw sound inferences from the data collected in an experiment.

To meet validity requirements and raise the level of the two data collection method in this research, the researcher followed many procedures.

1. The use of different data collection method in this research ensures that data are really about what they appear to be about, telling you what you think they are telling you (Saunders et al., 2000). Many questions which were asked in the questionnaire were re-explained in semi-structured interviews to ensure that the findings resulting from the questionnaire would be validated by the findings from the semi-structured interviews.

2. The use of the entire population was targeted as the sample for this research which raises the external validity; furthermore, there was a high response rate, for the questionnaire (80.9%) and (80%) for the semi-structured interviews.
3. The pilot study for the questionnaire was conducted in three stages: colleagues, academic experts and target companies. This test was to judge the content and face validity of the questionnaire. They suggested that the content validity of the questionnaire was established.
4. An extensive literature review was undertaken to define and clarify the scales and the means of measures. In this research many questions used in the questionnaire were adapted from related studies, which place an emphasis on meeting the requirements of validity and reliability.
5. A questionnaire called a personally administrated questionnaire was distributed and collected by the researcher himself, which gave the researcher a good opportunity to explain and clarify any misunderstanding or ambiguity about questions and the way of answering; also, the researcher tended to check the questionnaire after collecting it from each respondent to make sure that the questionnaire was completed.
6. Semi-structured interview validity, according to Easterby-Smith et al. (1991, p. 41) refers to the extent to which “*the researcher has gained full access to the knowledge and meanings of informants*”. Saunders et al. (2007) added that the validity of in-depth and semi-structured interviews is very high; the flexible and responsive interactions give them an advantage which will be possible between interviewer and interviewee allowing the meaning to be probed to cover the topic from a variety of angles and questions to be made clear to respondents.
7. The researcher followed several procedures in order to encourage and stimulate the respondents to give the required data through good advanced preparation for the interviews. In addition, the researcher built a trusting relationship with all the respondents by making a personal visit to their offices to explain the importance and benefit of this research in the Jordanian context; also, they were the shown

cover letter from Al- Hussein Bin Talal University. The researcher let them choose the time and place for conducting the interviews, preparing a clear introduction before posing questions to allow the respondents to prepare answers them, and he confirmed the confidentiality of the collected data. The researcher wrote notes and recorded all the interviews.

Reliability

Reliability of a measure indicates the extent to which it is without bias (error free) and, hence, ensures consistent measurement across time and across various items in the instrument (Sekran, 2003). The researcher had undertaken several procedures to ensure that the data collection methods were error free and to minimise the biases of the instruments. Throughout the process of collecting the questionnaire the researcher tried to ensure that it was the respondents who had completed the questionnaire by having discussions with respondents. Some important issues related to the research topic were posed in different parts of the questionnaire and in both instruments.

In this study, Cronbach's alpha measurement of internal consistency was undertaken to evaluate the overall reliability of the measurement scale, where alpha gives an estimate of the proportion of the total variance that is not due to error which represents the reliability of the scale (Oppenheim, 1992). The recommended minimum acceptable level of reliability "alpha" is 0.60 using Hair et al's (1998) criterion and greater than .50 using Nunnally's (1978) criterion. Table 5.4 shows the independent and dependent variables Cronbach's alpha results.

Table 5.4 Independent and dependent variables Cronbach's alpha results

No	Factors	Questions	Reliability
1	Top management commitment and support	1+2+3	0.768
2	Quality communications and structure	4+5+6+7	0.800
3	Employees empowerment and training	8+9+10+11+12+14	0.818
4	Quality measurement and benchmarking	15+16+17+18+22	0.638
5	Continuous improvement	19+20+21+23+24	0.742
6	Customer focus	25+26+27	0.749
7	Organisational culture	13+28+29	0.669
8	Quality information system	30+31+32	0.843
9	Policy and strategic planning	33+34+35	0.744
10	Suppliers relationship	36 + 37 +38	0.706
11	Market share	45+55+56	0.637
12	Profitability	46+47+51	0.759
13	Service quality	52+53+49	0.739
14	Effectiveness	48+50+54	0.751

Source: Data analysis result

Regarding semi-structured interview reliability, Easterby-Smith et al (1991 or 2002) confirmed that it is concerned with whether alternative interviewers would reveal similar information. The researcher, on the other hand, provided the interviewees with a list of the interview themes before conducting the interview. The rationale behind this procedure is to promote validity and reliability by enabling the interviewees to consider the information which is requested and allowing interviewees the opportunity to assemble supporting organisational documentation from their files (Saunders et al., 2003).

In addition, Saunders et al. (2007) mentioned that concern about reliability is related to the issue of bias. In this study the researcher avoided interviewer bias which will result from the comments, tone or non-verbal behaviour to create bias in the way that interviewees respond to the questions being asked. In this context the researcher tried to develop trust with the interviewees by a good introduction of the study which

emphasised the confidentiality. He left the interviewees to talk in the manner they wanted and gained permission from them to record the interviews (Saunders et al., 2007).

5.11 Fieldwork process

The fieldwork of this research was conducted in Jordan – the homeland of the researcher – from the middle of June 2006 to the middle of September 2006.

At the beginning stage of the fieldwork process the researcher made a personal visit to the Telecommunications Regulator Commission and the Amman Financial Market in Jordan to get the organisations' addresses that were licensed and listed. Then the researcher made a personal visit to each company in order to introduce himself and his study and to build rapport and strong trust with the participant to determine a deadline for completing the questionnaires. In addition, through these visits the researcher was able to determine which managers who are in charge and be interviewed. Moreover, in these visits the researcher arranged appointments to bring the questionnaires.

The questionnaire was distributed and collected by the researcher himself. According to Sekaran (2003), the advantages of this type of questionnaire are its ability to establish a good rapport with respondents to motivate respondents, to allow any doubt or questions about the questionnaire to be clarified, it is less expensive when distributed to group of respondents and it gains an almost 100% response rate.

The researcher delivered the questionnaire with a cover letter from the researcher's sponsor (Al Hussein Bin Talal University) to the participants' to make sure that the questionnaire would be completed by them.

The 120 questionnaires were distributed to 27 companies; the sample was all general managers, quality management managers and quality management employees.

To keep in touch with the respondents the researcher left his phone number in case the respondents faced any difficulty in answering any question and he asked the respondent

to call him when the questionnaire was ready to be collected. However, during the completion period the researcher phoned the participants to encourage and remind them to complete the questionnaire. By doing so, he asked them if there were any misunderstood or ambiguous questions.

Fortunately the researcher had a chance to meet his supervisor in Amman after finishing the distribution of the questionnaires. That meeting gave the researcher the opportunity to have useful directions, especially as that meeting took place in the middle of the fieldwork period.

Through collecting the questionnaire the participants who had completed the questionnaire asked the researcher if he wanted any other help in the future; they were happy to give the researcher their business cards to keep in touch with him in the future. A total of 93 questionnaires were returned, five of which were unusable (left part, half completed) so a total of 88 questionnaires were usable.

These questionnaires underwent preliminary analysis by using SPSS program version 12.0.

The second stage of the data collection was semi-structured interviews with General and quality management managers, these were used to give a clear understanding of the themes that had emerged from the use of the questionnaire. A sample for interview was chosen from the largest 10 companies according to number of employees. During the questionnaire collection the researcher had approval and appointments to interview both General and quality managers in those companies. The time and place of the interview were chosen by the interviewees themselves which gave the advantage of flexibility of choosing the best time and place for them. However, most of the interviews were held in the managers' offices for their convenience. The researcher sent emails to each interviewee before the time of interview to confirm the appointment. As a part of the research, the researcher needed to provide the interviewees with a cover letter to explain the aims of the interview and give them the questions listed in the interview and, in addition, to seek their cooperation. The managers were interviewed individually and

each interview took about half an hour. The questions included both open-ended and some close-ended questions. However, the interviewees talked in general and, actually, they provided more important related issues. All interviews were conducted in Arabic. In conducting the semi-structured interviews, the researcher took notes in addition to recording the whole interview on tape in order to remember all the details. However, each interviewee was explicitly asked whether or not the interview could be tape-recorded. Eleven interviewees allowed the researcher to tape-record the interviews, the other five did not.

The researcher provided the interviewees with the option to stop tape-recording when they wanted. The benefit of that action was to let the interviewees have the freedom to express their view. When the interviewees did not feel free to express their views if there was a tape-recording, the researcher wrote the notes in a note book. In the process of conducting the interviews, every interviewee was asked the questions in the same way, tone and style and was given complete freedom to express views and interpretations of the questions. The researcher assured utmost confidentiality of the provided data. Finally, it is worth mentioning that close questions were written on cards to be provided to the interviewees giving them the opportunity to read these questions to avoid any kind of bias. Each interview finished with the researcher thanking the interviewee and showing his appreciation for their time and co-operation.

The researcher aimed to make 20 semi-structured interviews; a total of 16 were achieved, while 4 were not achieved because 2 of the people were very busy and 2 others cancelled the appointments many times until it was too late. Three of them were general managers and one of them was a quality manager. The third stage of the data collection method was semi-structured interviews with customers of the ten biggest companies that were mentioned previously.

5.12 Difficulties in conducting the fieldwork

Generally the fieldwork processes were successful and the respondents were very supportive and co-operative. In spite of that, some difficulties faced the researcher. The first problem was that the researcher was living in different places. He was living in Petra City while the whole study population was located in Amman which is about 250 kilometres away. This meant that the researcher had to stay in Amman and leave the rest of his family in Petra. The second difficulty was that the researcher made many visits to each company and usually he had to wait, even when he had an appointment.

Some managers were not available to conduct their interviews because of being busy and some of them cancelled their appointments many times.

5.13 Data analysis

As mentioned before, both quantitative and qualitative approaches were employed within the current study. The questionnaire was used as a main data collection method and semi-structured interviews were conducted with the managers and regular customers in order to explain more about the themes that emerged from the questionnaire. The following paragraphs give a brief discussion about the tests and the methods used in analysing the obtained data.

5.13.1 Statistical methods

The nature of the data and the relationship between the method and the research objectives are considered as the basis for selecting the right statistical methods. Therefore, this study used what is relevant to the research question and framework. The descriptive analysis of the data is the first statistical technique used to provide a summary of the respondents' demographic characteristics using means, frequencies and standard deviations of the responses. Descriptive statistics, called exploratory statistics, involve the transformation of raw data into a form that will provide information to

describe a set of factors in a situation. This is accomplished through ordering and manipulating the raw data collected (Sekaran, 2003).

Pearson's correlation coefficient is the second statistical technique. It indicates the strength and the direction of the relationship between a pair of interval variables (Cohen and Cohen, 1983; Owdeh and Malkawi, 1992; Bryman and Cramer; 2001; Al-Zoubi and Al-Talafha, 2004). Bryman and Cramer (2001) argue that, a Pearson's rank correlation analysis varies between -1 and +1, therefore, if the correlation between two variables was -1 or +1, it would refer to a perfect correlation. The levels of 0.01 and 0.05 were used as the criterion for accepting differences or relationship as statistically significant. Bryman and Cramer (1998, p.178) cited from Cohen and Holliday (1982), recommend the following: 0.19 and below is very low; 0.20 to 0.39 is low; 0.40 to 0.69 is modest; 0.70 to 0.89 is high; 0.90 to 1 is very high.

Multiple regression is another statistical technique used in the current study. It was recommended by Hair et al. (1998) that multiple regression analysis is a statistical technique that can be used to analyse the relationship between a single dependent variable and several independent variables and the objective of multiple regression analysis is to use the independent variables to predict the single dependent value selected by the researcher. Therefore, in this research multiple regression analysis was used to produce the adjusted R^2 , R, F and P values that were advantageous for testing the hypotheses. Multicollinearity is another statistical test used in the present study. Field (2005) mentions that multicollinearity causes a problem for multiple regressions since it can affect the parameters of a regression model.

5.13.2 Qualitative data analysis

Because of its nature, there is no standardised approach to the analysis of qualitative data (Saunders et al., 2003). Bryman (2004, p. 398) noted, "*clear-cut rules about how*

qualitative data analysis should be carried out have not been developed'. As such, there are many qualitative research traditions and approaches with the result that there are also different strategies to deal with the data collected (Saunders et al., 2003).

Although different approaches are not mutually exclusive they can be combined, it can be argued that the thematic analysis approach is the best one to be used in this study. The interest or emphasis of thematic analysis is on the content of the speech and the researcher focuses on what is said more than how it is said (Riessman, 2004). The analysis process of the research qualitative data started when the researcher finished collecting the data. The data obtained from the interviews was processed and analysed using a number of steps. It started by listening carefully to the tapes and then transcribing them by writing down each participant's response on a separate sheet of paper. Processing and analysing interviews normally takes time because the researcher needs to listen carefully to the tape recorder, transcribe, read and re-read the data repeatedly (Drever, 1995). Therefore, the researcher read transcribed data accurately in order to identify the topic area related to the study aim. Each question's responses were put together and re-written on different sheets of paper so that all the answers to a particular question were together. Categories of the responses to each question were developed and relevant data was placed under each category. The responses were described in terms of the topics or categories and quotes were used to illustrate them.

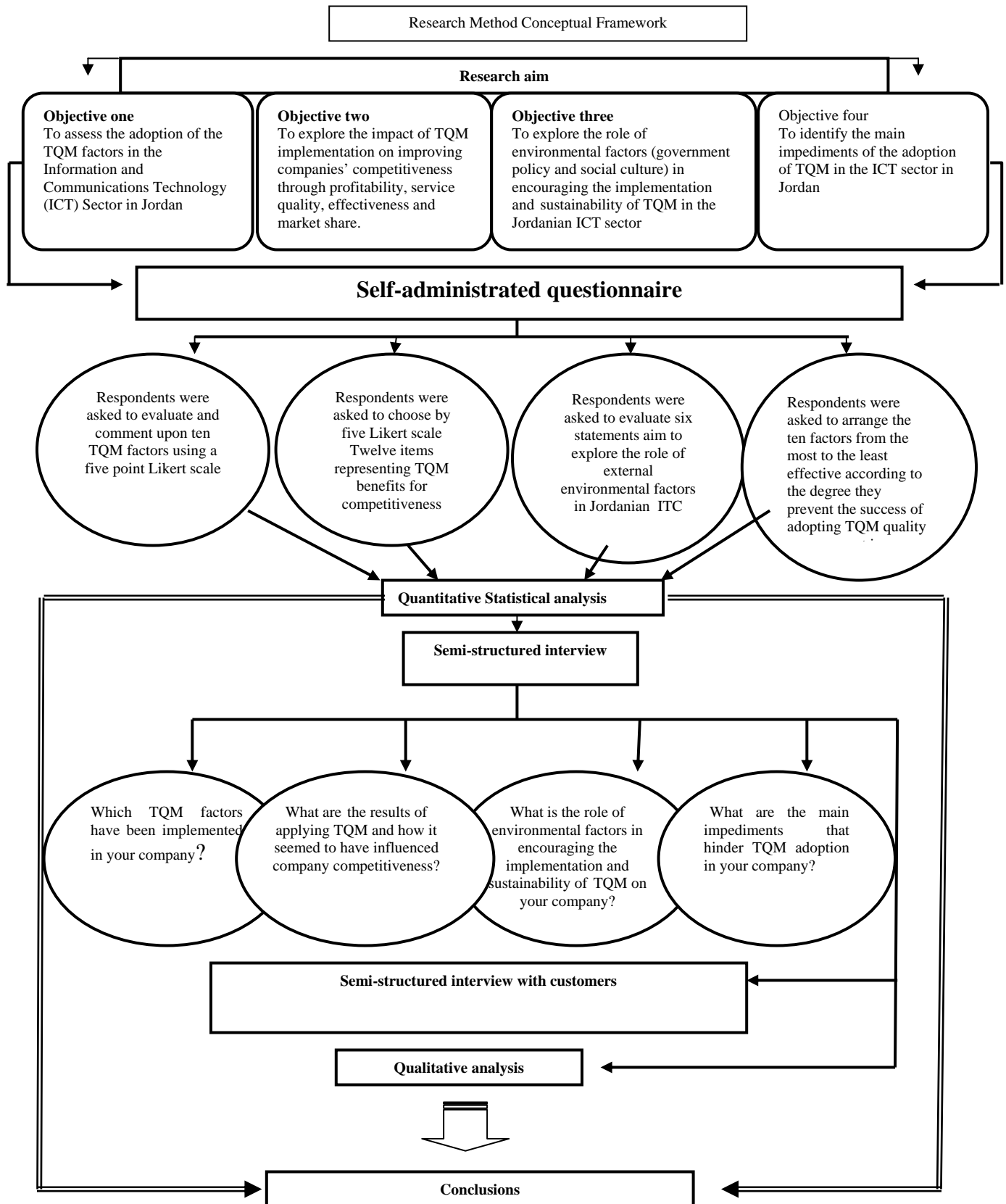
5.14 Chapter summary

This chapter presented and justified the research philosophy and design adopted in this study to meet the research aim and objectives. The methodology used in this research, described as cross-sectional study, adopted a multi-methods approach (quantitative and qualitative) conducted through questionnaire and interviews, to achieve the study objectives. The justification behind this choice was provided within this chapter. A questionnaire was used as the main method of data collection while semi-structured interviews aim to explain and support the results that emerge from the questionnaire. A

pilot study was carried out prior to the distribution of the final version of the questionnaire; a number of drafts were prepared and amended in response to feedback received from referees and a group of experts in the TQM field. The questionnaire design and layout, question types and format, contents of the final version of the questionnaire, population and sample and the procedures of administering the questionnaire were discussed in this chapter. Also, the issues of reliability and validity were addressed. Furthermore, the chapter ended with a logical description and discussion of the statistical methods used in this study to achieve its objectives.

The following diagram (Figure 5.3) explains the methodology used in the research by mapping the research aim and objectives, the data collection instruments (quantitative and qualitative) and their aim and process which are linked directly to the aim of research, an analysis of the results and the conclusion which are presented in the following chapters.

Figure 5.3: Research Method Conceptual Framework



Chapter Six

Presentation of the findings

6.1 Introduction

This chapter aims to present and analyse the data obtained from both self-administered questionnaires and face to face semi-structured interviews in relation to the research's objectives respectively. The chapter, hence, is divided into four main sections. The first one aims to assess the extant data to show the adoption of TQM factors in the ICT sector in Jordan. The second section deals with examining and exploring the impact of TQM implementation as an independent variable to improve companies' competitiveness as a dependent variable. The third section aims to explore the role of environmental factors to encourage the implementation and sustaining of TQM in the Jordanian context. Finally, the fourth section deals with identifying the main impediments of TQM adoption in the ICT sector in Jordan.

6.2 Characteristics of respondents

The aim of this section is to describe the characteristics of the sample of the respondents, general managers, TQM managers and TQM employees. Table 6.1 shows that these characteristics have been broken down into five main groups: gender, age, job, experience in the field of TQM and education level. This will be considered further in 7.2 to indicate how this is representative of the population.

Table 6.1 The characteristics of respondents

Gender	Frequency	Percentage
Male	65	73.9
Female	23	26.1
Sum	88	100%
Age		
20-30	28	31.8
31-40	33	37.5
41-50	22	25.5
More than 50	5	5.7
Sum	88	100%
Job		
General manager	23	26.1
TQM manager	10	11.4
TQM employee	55	62.5
Sum	88	100%
Experience		
Less than 3 years	20	22.7
3-6 years	37	42.0
7-10 years	18	20.5
More than 10 years	13	14.8
Sum	88	100%
Educational level		
High school or equivalent	1	1.1
Bachelor	73	83.0
Postgraduate	14	15.9
Sum	88	100%

Gender and age of the participants

Table 6:1 shows that 73.9% of 88 respondents were male while 26.1% were female. The age category is presented at 4 main levels, where 31.8% of respondents were aged between 20 and 30 years, 37.5% were aged between 31 and 40 years, 25.5% between 41 and 50 years and 5.7% were more than 50 years old.

The job title of the participants

Table 6:1 shows that 26.1% of 88 respondents were general managers, 11.4% were TQM managers and 62.5% of them were TQM employees. From this table it can be seen that the percentage of general manager respondents is higher than the percentage of

TQM managers. The reason behind this result is because not all the companies have TQM department and TQM managers.

Experience of the participants in the TQM field

Table 6:1 shows that 22.7 % of 88 respondents had less than 3 years' work experience in the TQM field while 42 % had between 3 and 6 years, 20.5 % had between 7 and 10 years and 14.8 % of them have more than 10 years. This indicates that the respondents have a medium level of experience; this is because the subject is relatively new in Jordan.

Education level of the participants

Table 6:1 shows that 15.9% of 88 respondents hold postgraduate degrees, 83 % hold Bachelor degrees and 1.1 % of them hold high school degrees or equivalent. This indicates that the respondents are well educated and that Jordanian companies have an interest in educational qualifications for their managers and TQM employees.

6.3 The characteristics of participants' companies

The main purpose of this section is to provide a brief idea of the companies' characteristics. It covers six main features: ownership, region, type, standardizations, employee numbers, and company class.

Table 6.2 The Characteristics of companies

Ownership	Frequency	Percentage
Public shareholding company	18	20.5
Private company	70	79.5
Sum	88	100%
Region		
Local	40	45.5
Regional	2	2.3
Local and regional	38	43.2
International	8	9.1
Sum	88	100%
Type		
National	42	47.7
International branch	10	11.4
Franchises of international company	2	2.3
Strategic sharing	34	38.6
Sum	88	100%
Standardization		
Only Jordanian	7	8.0
ISO	81	92.0
Sum	88	100%
Employee number		
Less than 100	32	36.4
Equal or more than 100	56	63.6
Sum	88	100%
Company class		
Cellular	30	34.1
Data communications service	33	37.5
Land telephone, paging, pre-paid card service, radio trunking, global mobile "satellite"	25	28.4
Sum	88	100%

Reflecting on table 6:2 it can be seen that ownership of the company recorded 20.5% of the participant public shareholding companies, but 79.5 % were privately owned. Table 6:2 also shows that 45.5 % of the participant companies are local, while 2.3% are regional. On the other hand, local and regional companies recorded 43.2%, while international companies recorded 9.1%.

To reflect company ownership type, table 6:2 shows that 47.7 % of the companies were national, while 11.4 % were international branches. On the other hand, a strategic sharing relationship was recorded at 38.6 % and franchise of international company was recorded at 2.3 %.

Building on the data collected from the questionnaire, table 6:2 shows that the companies which work within Jordanian standardization recorded 8.0 %, while the ones which work within the ISO standardization recorded 92.0%. Moreover, the companies with less than 100 employees' were 36.4%, but companies with 100 or more employees were 63.6 %. Also, table 6:2 shows that 34.1 of the companies are mobile companies, while 37.5% are data communication services and 28.4% are from other classes, which encompasses land line telephone, paging, pre-paid cards services, radio trunking, and global mobile satellite.

The previous section introduced in detail the characteristics of the participant companies in order to illustrate the real value of the research.

6.4 Data analysis presentation

The fundamental aim of this section is to analyse the collected data that came from the current study (see sections 5.9.1.9 and 5.9.2.1) and present them in sequence, also to exhibit the research objectives. In order to do so, the researcher has employed results from a mixed methodology, both quantitative (self administrative questionnaire) and qualitative (face to face semi-structured interviews).

6.4.1 First objective: To assess the adoption of TQM in the ICT sector in Jordan.

Questionnaires findings

The researcher built his questionnaire on the ten TQM factors that have been discussed in chapter four. The factors are: top management commitment; quality structure and communications; employee empowerment and training; quality measurement and benchmarking; continuous improvement; customer satisfaction; organisational culture; quality information systems; policy and strategy planning; supplier's relationships (refer to section 4.1 and 4.2). In the next section the researcher deals with each of these factors separately in more detail.

Top management commitment (TMC)

The value of TMC has been measured by a group of questions that is built on five - points of the Likert scale (1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree). The participants were asked to answer at which point they would mark to agree with or disagree with the given statements. They needed to employ their experience of a top managers' commitment of quality. The average of the Likert scale is 3 $((1+2+3+4+5)/5)$, therefore, a mean above 3 shows an agreement with the statements while a mean below 3 show overall disagreement.

Table 6.3 Top management commitment

NO	Statement	Mean	STD.Dev
1	Senior executives assume active responsibility for the evaluation and improvement of management systems and for leading quality drive	3.90	.58
2	Senior executive are visibly and explicitly committed to quality	4.28	.06
3	There is an inclination of the top management to allocate adequate resources and time for quality management efforts	3.41	.63
	TMC	3.86	.50

Source: Data analysis result

Table 6.3 shows that the extent and degree of top management commitment in TQM adoption in Jordanian ICT companies recorded a moderately high rank. *Senior executives are visibly and explicitly committed to quality* recorded the top element rank with the highest mean of 4.28 which shows that the top managers are highly committed

and aware of the need for quality management in their companies. Moreover, the table shows that *Senior executives assume active responsibility for the evaluation and improvement of management systems and for leading quality drive* had a mean of 3.90 while, *There is an inclination of the top management to allocate adequate resources and time for quality management efforts* had a mean of 3.41. The overall mean of 3.86 indicates the respondents' agreement to the statements in relation with the top management commitment towards the application of TQM.

Quality communications and structure (QCS)

Table 6.4 shows the results of measuring the QCS factor. The researcher measured this factor by four questions on a five-point Likert scale. All the respondents were asked to state to what extent they agree or disagree with the given statements regarding the level of QCS in their companies.

Table 6.4 Quality communications and structure

No	Statement	Mean	STD.Dev
1	There is a formal cross-functional communication structure /system in place	3.86	.98
2	There is a clear and consistent process for the communication of mission statement and objectives defining quality values, expectations and focus	3.91	.90
3	Elements of quality management structure are in place to manage the organisation's quality journey	4.01	1.011
4	Major elements of quality management structure are in place to facilitate the organisations quality strategy objectives	3.85	.91
	QMC	3.90	.75

Source: Data analysis result

Table 6:4 reveals that the “*Elements of quality management structure are in place to manage the organisation's quality journey*” ranked the highest with a mean of 4.01, while *There is a clear and consistent process for the communication of mission*

statement and objectives defining quality values, expectations and focuses had a mean of 3.91 and *Major elements of quality management structure are in place to facilitate the organisations quality strategy objectives* had a mean of 3.85. The average mean of the whole section is 3.90, which indicates an overall agreement with the QCS statements.

Employee empowerment and training (EET)

Table 6:5 (see appendix D) shows that the level of EET ranked a reasonable rate measured through six questions on a five-point Likert scale. All the respondents were asked to state to what extent they agreed or disagreed with the given statements regarding the level of employee empowerment and training. Table 6.5 shows the results.

Table 6:5 (see appendix D) reveals that not all elements have a high mean. *There is a system that links reward to employees' quality achievement* ranked with a mean of 3.91. *Training is provided for employees to improve interactive skills (such as communication skills, effective meeting skills, and leadership skills)* had a mean of 3.89. *In your company most employees suggestions are implemented* had a mean of 3.55. *Employees are encouraged to accept responsibility for quality* ranked with a mean of 3.80. The following two statements ranked with the same mean of 3.83: *There is system for recognition and appreciation of quality effort and success of individuals and teams* and *Quality- related training is given to all employees in the company* had a mean of 3.83. The overall mean of the section of EET is 3.80, which shows that empowerment and training factors are implemented in the companies.

Quality measurement and benchmarking (QMB)

Table 6:6 (see appendix D) measures the level of using QMB. The researcher measured this factor on a five-point Likert scale by using five questions. All the respondents had been asked to mark to what degree they agreed or disagreed with the given statements regarding the level of QMB.

Table 6:6 (see appendix D) illustrates in detail the value gained from applying QMB and that QMB in the ICT sector in Jordan has recorded a satisfactory rate. *SPC is used to control variability and improve processes* has ranked at the top level with the highest mean of 4.51 whereas, *Competitive benchmarking is made against primary competitors* has recorded the second highest with 3.86. On the other hand, *Cost of quality process to track rework, waste, rejects and for continuous improvement is prioritised* had a mean of 3.66 and *Informal benchmarking and other formal forms of information acquisition and sharing with organisations in different sectors are in place to identify best practices for improvements and opportunities* had a mean of 3.57. Finally, *there is a use of self-assessment tools and other mechanisms to track and improve performance gaps in the implementation and effectiveness of system, process and practices* had the lowest mean of 3.01. The overall mean of 3.72 shows that QMB is implemented in the companies.

Continuous improvement (CI)

CI was measured by five statements. The respondents had been asked to state on a five point Likert scale their agreement or disagreement with the given statements concerning CI in their companies.

The table 6:7 (see appendix D) reveals that the level of application of CI in ICT companies in Jordan is not high; the mean of all elements is under 4. *A team approach is taken (such as quality circles, cross functional teams) as the main feature to solve problems, decision making* had a mean of 3.84, whereas *The company's management gives great importance to research and development for the design and development of its products and services* had a mean of 3.75. While *The company builds its competitiveness on the basis of providing high quality services* had a mean of 3.73, *The company's management always delivers the latest technology for contributing the application of Total Quality management* a mean of 3.70 and *In your company emphasis on CI has been applied in all operations and at all levels* had a mean of 3.66. The

overall mean of the section was 3.74, indicating agreement with the statements regarding continuous improvement in the companies.

Customer satisfaction (CS)

CS was measured through a number of statements. The researcher asked the respondents to state their agreement or disagreement with given statements concerning CS in their companies on a five point Likert scale. The results are given in table 6:8(see appendix D).

Table 6:8 (see appendix D) reveals the results regarding the level of intention about customer satisfaction in Jordanian ICT companies. The results vary between high and moderate interest. *Your company uses customer surveys, feedback processes and tracking of other key measures to assess customer satisfaction* ranked with a mean of 4.16, while *Within your company there is comprehensive identification of customers and customer needs and alignment of process to satisfy the needs* had mean of 3.91 and *Systematic reviews and analysis of key process measures that have a direct or indirect impact on value– addition to customer satisfaction are implemented* a mean of 3.40. An overall average of 3.81 is recorded indicating that the respondents agreed with the CS statements.

Organisational culture (OC)

Table 6:9 (see appendix D) shows OC results collected from the questionnaires, measured through a group of statements on a five-point Likert scale. All the respondents had been asked to state to what extent they agreed or disagreed with the given statements regarding the prevailing OC in their companies. The table reveals that this factor has the lowest mean compared with the other factors within this study. *Quality awareness building among employees is ongoing in the company* ranked with a mean of 3.74. *Management trust the employees to do their work properly* had a mean of 3.73 and *Your*

company supports any change in style or structure required to adapt to changes in the business environment a mean of 3.72.

Quality information systems (QIS)

Table 6.10 (see appendix D) shows the results concerning the availability of QIS in the Jordanian ICT sector, as stated by the respondents. It was measured through a group of 3 questions on a five-point Likert scale. All the respondents were asked to state to what extent they agreed or disagreed with the given statements regarding quality information systems in their companies.

Table 6:10 (see appendix D) reveals that *Your company uses the information systems to provide high-quality data and information to employees* has the highest mean in this group. It ranked with a mean of 4.19, while *the company possesses a web site which provides all the information needed by the customer about the products and services provided by the company* had a mean of 3.81 and *there is an advanced technological information system to support implementing an advanced quality management system* had a mean of 3.65. Overall, a mean of 3.88 is recorded, showing that there is agreement of the QIS statements.

Policy and strategy planning (PSP)

Table 6:11 (see appendix D) shows the results ranking the availability of PSP in the Jordanian ICT sector. It was measured through a group of statements on a five-point Likert scale. All the respondents were asked to state to what extent they agreed or disagreed with the given statements regarding policy and strategic planning in their companies.

Table 6:11(see appendix D) reveals that PSP has the highest mean compared with the other factors within this study. *There is comprehensive policy development and effective deployment of goals* in the company ranked with a mean of 4.22 while *TQM principles*

are used in the formulation reviewing and implementation of strategy had a mean of 3.98 and *There is strategic quality planning of the long term quality journey* had a mean of 3.83. An overall mean of 4 gives an indication that the whole section is agreed.

Supplier's relationships (SR)

Table 6:12 (see appendix D) shows the results about the nature of SR in Jordanian ICT companies. It was measured by a group of statements on a five-point Likert scale. All the respondents were asked to state to what extent they agreed or disagreed with the given statements regarding the suppliers relationships in their companies.

Table 6:12 (see appendix D) shows that this factor has a high mean in the context of Jordanian ICT companies. *Your company develops relationships with your suppliers that lead to continuous improvements in quality* ranked with a mean of 4.06 while *Your company relies on relatively few dependable suppliers who are evaluated and selected based on their capability and commitment to produce, service quality and value for money* with a mean of 3.99 and *The company conducts periodic examinations of the materials supplied to ensure conformity with the standard specifications* had a mean of 3.85. The overall mean of the section was 3.96. To sum up, all the data which has been presented and discussed previously was collected by a questionnaire built on a five-point Likert scale. The collected data identifies that the highest rank has been marked for PSP with a mean of 4.00, while the lowest level was recorded for OC with a mean of 3.72 which could be a reasonable sign that there is a clear understanding of the value of TQM.

Interview findings

The main aim of applying the interview methodology for the research is to clarify and confirm the ten TQM factors that have been mentioned before at the questionnaire finding. This was carried out by asking 16 general and TQM managers in 10 companies (the stratification of the research). The interviews were conducted as semi-structured

face-to-face ones. The results of the interviews have shown that all TQM factors were discussed by all 16 participants, but not one of the 16 participants mentioned the ten factors together. For instance, some of them mentioned 8 out of 10 some 2 out 10. Moreover, the interviewees provided a new factor which is social responsibilities, as shown in table 6:13.

Table 6.13 the interviews results of TQM factors implementation

TQM factors	Valid N= 16 interviews	
	Number mentioned	%
Top management commitment	12	75.0
Quality structure and communications	10	62.5
Employee empowerment and training	7	43.75
Quality measurement and benchmarking	8	50.0
Continuous improvement	6	37.5
Customer satisfaction	15	93.75
Organisational culture	5	31.25
Quality information systems	11	68.75
Policy and strategy planning	13	81.25
Suppliers' relationships	11	68.75
Social responsibilities	3	12.5

Source: Data analysis result

Through the semi-structured interview it is shown that the managers indicated that TQM application varies in different factors; for instance, customer satisfaction, policy and strategy planning, top management commitment, quality information systems and suppliers' relationship were the most frequent factors in the managers' answers.

6.4.2 Second objective: To examine and explore the impact of TQM implementation as an independent variable to improve companies competitiveness as a dependent variable.

In order to achieve this objective the researcher has applied both quantitative and qualitative approaches. The quantitative approach involves multiple regressions that have been applied to test the research hypotheses stemming from the theoretical model. The qualitative approach involved the use of face-to-face semi-structured interviews to explore and gain more understanding about some research hypotheses.

The impact of TQM implementation on improving companies competitiveness

This part of the research aims to illustrate the findings which emerged from applying the quantitative approach. As mentioned before, the researcher applied the multiple regression analysis approach to test the emerging hypotheses. The purpose behind employing multiple regression analysis is to identify how much of the variance in the dependent variable will be explained when several independent variables are theorized to influence it simultaneously.

Assumptions of using multiple regression analysis

According to Hair et al. (1998) and Field (2000) the following assumptions must be met when undertaking multiple regression analysis

1. Variable types should be measured on the interval level (Field, 2000). In this study the variables are not intervals, as they are all measured on a five point Likert scale. However, there are many previous studies in same field have used ordinal data in multiple regression models, for example Ahire and O'Shaughnessy (1998) in their study "*The role of top management commitment in quality management*"; Chapman and AL-Khawaldeh (2002) in their study "*TQM and labour productivity in Jordanian industrial companies*"; Rad (2005)

in his study “*A survey of total quality management in Iran Barriers to successful implementation in health care organisations*”; Boon et al., (2005) in their study “*Does soft TQM predict employees’ attitudes?*”; and Samat et al., (2006) in their study “*TQM practices, service quality, and market orientation*”.

2. Variables should be uncorrelated between two or more of the predictors (Field, 2000). As there is a correlation between the independent variables in the study, it is suggested that one of four options should be used (Hair et al., 1998, p. 193). First, the researcher can omit one or more of the highly correlated independent variables and identify other independent variables to help the prediction. Second, the highly correlated variables in the model should be used with no attempt to interpret the regression coefficient. Third, to the correlation between each independent variable and the dependent variables should be used to understand the relationships. Fourth, more sophisticated methods should be used in the analysis. Accordingly, within the current study, the researcher considered options two and three to use the correlation to explain the relationships between each independent variable and the dependent variables, and to use the regression coefficient to explain the overall relationship in the model.
3. Normality distributed errors: one of the assumptions of multiple regression is that the “residuals in the model are random, normally distributed, variables with the mean of zero” (Field, 2000, p. 128). Within the current study it was clear that the residuals for the variables are normally distributed, with the mean of about the value of zero, and 95% of the residuals are within the range of -2 and +2 (refer to section 6.4.2.1).

Multiple regression analysis approach is a standard approach that is able to collate the relationship between the dependent variables and the independent variables. It was defined by Hair et al. (1998) as multiple regression analysis is a statistical technique that can be used to analyse the relationship between a single dependent variable and several

independent variables and the objective of multiple regression analysis is to use the independent variables to predict the single dependent value selected by the researcher.

Building on a multiple regression analysis result, the independent (predictor) variables are jointly regressed against the dependent (outcome) variable. The individual correlation is represented by the value of multiple R. The square of multiple R is the amount of variance explained in the dependent variable by the predictors, while the R^2 value and the F statistic and its significance level are known, it is possible to explain the results from a multiple regression analysis (Hair et al., 1998, p. 12).

As the variance in a dependent variable it is expected to be explained by a number of independent variables, Sekaran (2000) explained that the significant points are not only the independent or predictor variables correlated to the dependent variable in altering degrees, but they might also be inter-correlated among themselves. Thus, Field (2000) clarified that “*the correlation matrix is very helpful for reaching a rough idea of the relationships between predictors and the outcome, and for a preliminary look for multicollinearity*”. (Field, 2000, p12).

Factor analysis

The purpose of factor analysis is to reduce a large set of data into a smaller subset of measurement variable (Field, 2005). In other words, factor analysis identifies representative variables from each group of variables, or creates entirely new groups of variables smaller in number or replaces the original group of variables (Hair et al., 1998). However, Ahire et al., (1996) stated that one of the major limitations of factor analysis is that items identified for deletion should not be deleted because they are part of certain constructs that represent the variables of the study. Accordingly, in the current study, as the variables are all relevant to the study and cannot be reduced or regrouped, factor analysis was not used. Furthermore, the sets of variables used in this study originated from the literature and are validated by being used in different studies (refer to section 4.2); validity is one of the major assumptions for using a certain scale in a

research project (Ahire et al., 1996). For that reason, any summarization, reduction or regrouping of variables can effect the validity of the measurements used.

Furthermore, it is suggested that a certain sample size (preferably 100 or larger) is required (Hair et al., 1998, p. 98); less than 100 is used here.

Hence, the correlation coefficients between each of the predictor variables and the outcome, as well as those between the predictors themselves, shown in the correlation matrix, are presented and discussed as a first step towards discussing the results of the multiple regression analysis.

6.4.2.1 The hypothesis test

This section aims to measure the four main hypotheses formulated by the researcher. These four main hypotheses are related to the impact of the ten TQM factors that have been mentioned before (refer section 1.2) which are independent variables on the profitability, service quality, effectiveness and market share as dependent variables. In order to test each hypothesis, the researcher employed Pearson's correlation coefficient to illustrate the correlation between the independent and dependent variables and to show the correlation between the independent variables themselves. Then the result of the multiple regressions is introduced for each main hypothesis. That is going to be achieved by using model summary ANOVA and a coefficients model. Then, the final comments about the degree and strength of correlation are introduced in relation to each of the independent variables with the dependent variables.

H0: Total quality management implementation has no effect on profitability in the Jordanian ICT sector

H1: Total quality management implementation has a positive effect on profitability in the Jordanian ICT sector

In order to fit a model which explains profitability in terms of the independent variables (top management commitment, quality communications and structure, employees empowerment and training, quality measurement and benchmarking, continuous improvement, customer satisfaction, policy and strategic planning, quality information systems, quality culture and suppliers relationship) it is necessary look at the degree of correlation between profitability and the independent variables. A correlation matrix for Pearson's correlation coefficients between each of the variables was created.

Table 6.14 correlation results

		Profitability	TMC	QCS	EET	QMB	CI	CS	PSP	QIS	OC	SR
Profitability	Pearson correlation sig (2-tailed) N	1 .000 88	.761** .000 88	.439** .000 88	.568** .000 88	.674** .000 88	.395** .001 88	.709** .000 88	.494** .000 88	.635** .000 88	.336** .001 88	.351** .001 88
Top management commitment	Pearson correlation sig (2-tailed) N	.761** .000 88	1 .000 88	.543** .000 88	.542** .000 88	.705** .000 88	.342** .001 88	.734** .000 88	.676** .000 88	.601** .000 88	.171 .111 88	.413** .000 88
Quality communications structure	Pearson correlation sig (2-tailed) N	.439** .000 88	.543** .000 88	1 .000 88	.541** .000 88	.616** .000 88	.179 .096 88	.523** .000 88	.334** .001 88	.446** .000 88	.253* .017 88	.327** .002 88
Employ empowerment	Pearson correlation sig (2-tailed) N	.568** .000 88	.542** .000 88	.541** .000 88	1 .000 88	.547** .000 88	.169 .115 88	.550** .000 88	.486** .000 88	.483** .000 88	.326** .002 88	.329** .002 88
Quality measurement	Pearson correlation sig (2-tailed) N	.674** .000 88	.705** .000 88	.616** .000 88	.547** .000 88	1 .000 88	.415** .000 88	.783** .000 88	.669** .000 88	.671** .000 88	.280** .008 88	.550** .000 88
Continuous improvement	Pearson correlation sig (2-tailed) N	.359** .001 88	.342** .001 88	.179 .096 88	.169 .115 88	.415** .000 88	1 .000 88	.416** .000 88	.313** .003 88	.490** .000 88	.121 .262 88	.284** .007 88
Customer satisfaction	Pearson correlation sig (2-tailed) N	.709** .000 88	.734** .000 88	.523** .000 88	.550** .000 88	.783** .000 88	.416** .000 88	.1 .000 88	.718** .000 88	.690** .000 88	.306** .004 88	.471** .000 88
Policy and strategic planning	Pearson correlation sig (2-tailed) N	.494** .000 88	.676** .000 88	.334** .001 88	.486** .000 88	.669** .000 88	.313** .003 88	.718** .000 88	1 .000 88	.605** .000 88	.207 .052 88	.335** .001 88
Quality information system	Pearson correlation sig (2-tailed) N	.635** .000 88	.601** .000 88	.446** .000 88	.483** .000 88	.671** .000 88	.490** .000 88	.690** .000 88	.605** .000 88	1 .000 88	.441** .000 88	.539** .000 88
Organisational culture	Pearson correlation sig (2-tailed) N	.336** .001 88	.253* .111 88	.326** .017 88	.280** .002 88	.121 .008 88	.306** .262 88	.207 .004 88	.441** .052 88	1 .000 88	.332** .0002 88	
Suppliers relationship	Pearson correlation sig (2-tailed) N	.351** .001 88	.413** .000 88	.327** .002 88	.329** .002 88	.550 .007 88	.284** .007 88	.471** .000 88	.335** .001 88	.539** .000 88	.332** .002 88	1 .000 88

Resource: data analysis results

Table 6.14 shows that there is a correlation between the independent variables, themselves. It is, therefore, expected that there will be issues concerning multicollinearity between the predictor variables, which means that the coefficients in the regression model will not be reliable in measuring the individual effect of the

independent variables; they can, however, be used for the prediction of profitability (the relationship between the dependent variable and the independent variables together).

Field (2005) pointed out that multicollinearity causes a problem for multiple regressions since it can affect the parameters of a regression model (Field, 2005, p.33). Examining the collinearity diagnostics (VIF and tolerance) for this model, certain come to attention (the values of tolerance and VIF are from table 6.15).

According to Hair et al. (1998, p.191) there are three recommended methods for assessing multicollinearity: the presence of high correlation; the tolerance values; the variance inflation factor values. However, the variance inflation factor (VIF) showed no values that exceed the generally accepted maximum level of 10 (an indication of high levels of multicollinearity) and the tolerance values showed no values less than the maximum level of 0.2.

The VIF values range from 1.592 to 3.828, all well below 10, the value suggested by Myers (1990). Tolerance values range from 0.261 to 0.628. None should be below 0.1, since $\text{tolerance} = 1/\text{VIF}$, also, Menard (1995) suggests that values below 0.2 are cause for concern.

The average of the VIF values = 2.575. It is suggested by Bowerman and O'Connell (1990) that this should be no greater than 1. Therefore, this is indicating that multicollinearity problems may occur in this backward elimination model.

Therefore, the method of backward elimination is suggested to fit the regression model to test the general hypothesis regarding the relationship between the independent and dependent variables. In this method all the predictor variables are entered into the model. Each independent variable is examined to see if it contributes significantly to the predictive power of the model. If any of the predictor variables do not, then that which contributes least is removed from the model. This process is repeated until all the remaining predictor variables contribute significantly.

Table 6.15 Coefficient results for dependent variable profitability

Coefficients a

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistic	
	B	Std. error	Beta			tolerance	VIF
1 (constant)	.413	.281		1.466	.147		
Top management commitment	.532	.089	.582	5.964	.000	.350	2.854
Quality communication structure	-.131	.050	-.214	-2.637	.010	.506	1.976
Employee empowerment	.131	.057	.179	2.313	.023	.558	1.791
Quality measurement	.271	.112	.274	2.421	.018	.260	3.843
Customer satisfaction	.237	.105	.251	2.253	.027	.269	3.717
Policy and strategic planning	-.256	.066	-.366	-3.876	.000	.375	2.664
Quality information system	.145	.069	.195	2.100	.039	.387	2.584
Organisational culture	.117	.063	.125	1.858	.067	.735	1.360
Suppliers relationship	-.128	.005	-.172	-2.330	.022	.616	1.623

a. Dependent variable: profitability

Source: Data analysis result

The resulting model (table 6:15) includes all the predictor variables except improvement. All the independent variables have p-values below 0.05, except for culture ($p = 0.067$), showing that they have a significant contribution to the explanatory power of the model. The goodness of fit statistic $R^2 = 0.739$, so the model explains 73.9% of the variation in profitability. Since culture has a p-value of $= 0.067$, this was removed from the model to assess the difference in R^2 .

Table 6:16 explains the model with eight independent variables which have the effect on the level of profitability; it has $R^2 = 0.728$, $R^2 \text{ adj} = 0.700$.

Table 6.16 coefficients results for dependent variable profitability

Coefficients a

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistic	
	B	Std. error	Beta			tolerance	VIF
1 (constant)	.682	.254		2.786	.007		
Top management commitment	.502	.089	.549	5.633	.000	.363	2.758
Quality communication structure	-.124	.050	-.204	-2.479	.015	.508	1.967
Employee empowerment	.149	.057	.204	2.631	.010	.575	1.738
Quality measurement	.258	.114	.261	2.275	.026	.261	3.828
Customer satisfaction	.250	.107	.265	2.346	.021	.270	3.701
Policy and strategic planning	-.260	.067	-.371	-3.875	.000	.376	2.661
Quality information system	.183	.067	.246	2.732	.008	.424	2.358
Suppliers relationship	.114	.055	.135	-2.062	.042	.628	1.592

a. Dependent variable: profitability

The backward elimination model may be used to predict the value of profitability, but cannot safely be used to explain how each of the independent variables in the model affects the level of profitability. Therefore, using Pearson's correlation is recommended at this stage to explain how each of the independent variables contributes to the level of profitability (the dependent variable). Pearson's correlation is used to assess the degree and strength of correlation between the independent variables and the dependent variable (Sekran, 2003; Saunders et al., 2007). Also, Al-Qudah (2006) used multiple regression to assess the relationships between the independent variables all together with the dependent variable and used the Pearson's correlation coefficients to determine the degree of correlation between the dependent variable and the independent variables separately.

Subsequently, using Pearson's correlation matrix, table 6.14 gives the required coefficients to assess the degree of correlation between the independent variables and profitability as the dependent variable. According to Hair et al. (2003), the strength of correlation is assessed based on the range of coefficient, as explained in table 6.17.

Table 6.17 Rules of thumb about correlation coefficient size*

Coefficient range	Strength of association
-/+ .91- +/-1.00	Very strong
-/+ .71- +/- .90	High
-/+ .41- +/- .70	Moderate
-/+ .21- +/- .40	Small but definite relationship
-/+ .01- +/- .20	Slight, almost negligible

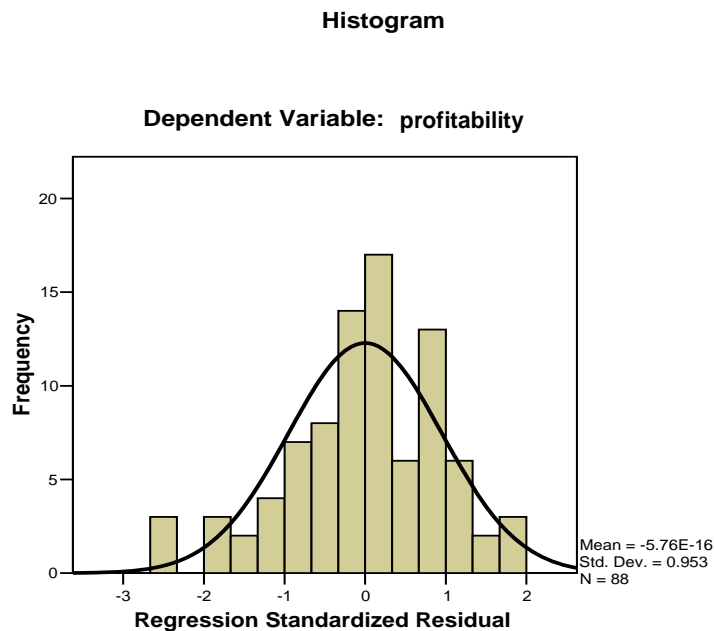
*Assumes correlation coefficient is statically significant
Source: Hair *et al.*, (2003, p.282)

It is found through this analysis that the commitment (76.1%) and customer (70.9%) were highly correlated with the level of profitability. The factors of benchmarking (67.4%), information system (63.5%), empowerment (56.8%), policy (49.4%) and structure (43.9%) were correlated at a moderate level with profitability. Improvement (35.9%), suppliers (35.1%) and culture (33.6%) were correlated at a small but definite level.

To support these results, the residuals are a measure of the difference between the observed values of profitability and the values of profitability predicted by the model.

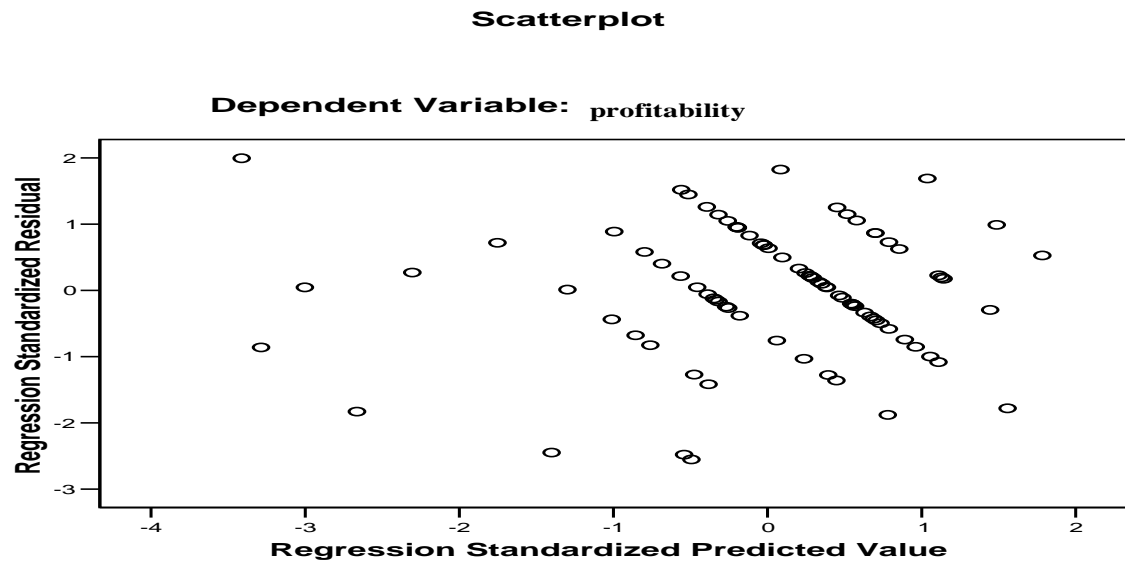
Residual analysis for backward elimination model

Figure 6.1 First Hypotheses Residual analysis for backward elimination model



Source: Data analysis results

Figure 6.2 First hypotheses residual analysis for backward elimination model



Source: Data analysis results

Standardised residuals

Standard residual is explained and defined as “*Rescaling of the residual to a common basis by dividing each residual by the standard deviation of the residuals. Thus, standardized residuals have a mean of 0 and standard deviation of 1. ... This provides a direct means of identifying outliers as those with values above 1 or 2 for confidence level of .10 and .05, respectively*” (Hair et al, 1998, p 219). As 0.95 of the values in the analysis of data in the current study lies between -2 and +2, it goes along with the previous quote that the level of error is at .05.

The histogram of the standardised residuals shows a plot which is close to normal distributed with a mean of zero. A regression model should have residuals which are normally distributed around the value zero. The plot of the standardised residuals against the standardised predicted values should be random and evenly dispersed around zero. At each level of the predictor variables the variance of the residuals should be constant

(i.e. no ‘funnelling’ in the graph above). This plot shows no real cause for concern as it is random about zero. Also, only three out of eighty eight of the standardised residuals are outside the range -2 to +2, so 95% lie within that range which indicates that the level of error is acceptable. According to Field (2000), standardized residuals with an absolute value greater than 3 are a cause for concern. In an ordinal sample it is expected that 95% of the cases should have standardized residuals within -2 and +2. The residual analysis indicates that the model fits the data well.

Table 6.18 ANOVA output for the first hypotheses

ANOVA b					
Model	Sum of squares	df	Mean square	F	Sig.
1 Regression	13.412	8	1.676	26.398	.000a
Residual	5.017	79	.064		
Total	18.429	87			

a. Predictors: (constant), suppliers relationship, quality communication, policy and strategic planning, employee empowerment, quality information system, top management commitment, customer satisfaction, quality measurement and benchmarking.

b. Dependant variable: profitability

Source: Data analysis result

The output shows the ANOVA table for the chosen model. The F-statistic = 26.398 with a p-value = 0.000. This indicates that the multiple regression model fitted, which includes quality management factors: top management commitment, quality communications and structure, employees empowerment and training, quality measurement and benchmarking, customer satisfaction, policy and strategic planning, quality information systems, and suppliers relationship as independent variables, is significant at 1% level in explaining the variability in profitability.

Referring back to the correlation matrix, which shows the correlation coefficients of each of the independent variables with profitability, and backward elimination regression, which shows the R and R square values for the profitability and the ten

independent variables, it is shown that all ten of the independent variables are positively correlated with profitability at 1% level of significance. Therefore, this analysis rejects H0 and supports H1, which means that H1 is fully accepted.

Finding from testing the second main hypothesis

H0: Total quality management implementation no effect on market share in the Jordanian ICT sector

H1: Total quality management implementation has a positive effect on market share in the Jordanian ICT sector

Table 6:19 shows a correlation matrix which presents the value of the Pearson correlation coefficient between every pair of variables. After that, the 1-tailed significance of each correlation is displayed and the number of cases contributing to each correlation ($N=88$) is shown.

With reference to the explanation about multicollinearity issues, considering market share as a dependent variable, it is positively correlated at 1 % level of significance with all the predictor variables except improvement and culture which are correlated at 5 % level. Also, table 6.19 indicates positive correlation between the independent variables themselves. The collinearity statistics show VIF values ranging from 1.557 to 3.190, all well below 10 and tolerance values ranging from 0.313 to 0.642. None should be below 0.1. The average of the VIF values = 2.346, which again indicates that multicollinearity problems may occur in this backward elimination model, so the coefficients of the variables cannot be interpreted in explaining the degree to which each of the independent variables affect the dependent variable.

Table 6.19 Correlation

		Market share	TMC	QCS	EET	QMB	CI	CS	PSP	QIS	OC	SR
Market share	Pearson correlation	1	.748**	.540**	.711**	.637**	.230*	.711**	.695**	.488**	.210*	.400**
	sig.(2-tailed)		.000	.000	.000	.000	.031	.000	.000	.000	.050	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Top management commitment	Pearson correlation	.748**	1	.543**	.542**	.705**	.342**	.734**	.676**	.601**	.171	.413**
	sig.(2-tailed)	.000		.000	.000	.000	.001	.000	.000	.000	.111	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Quality communications structure	Pearson correlation	.540**	.534**	1	.541**	.616	.19	.523**	.334**	.446**	.253*	.327**
	sig.(2-tailed)	.000	.000		.000	.000	.096	.000	.001	.000	.017	.002
	N	88	88	88	88	88	88	88	88	88	88	88
Employ empowerment	Pearson correlation	.711**	.542**	.541**	1	.547**	.169	.550**	.486**	.483**	.326**	.329**
	sig.(2-tailed)	.000	.000	.000		.000	.115	.000	.000	.000	.000	.002
	N	88	88	88	88	88	88	88	88	88	88	88
Quality measurement	Pearson correlation	.637**	.705**	.616	.547**	1	.415**	.783**	.669**	.671**	.280**	.550**
	sig.(2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.008	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Continuous improvement	Pearson correlation	.230*	.342	.179	.169	.415**	1	.416**	.313**	.490**	.121	.284**
	sig.(2-tailed)	.031	.001	.096	.115	.000		.000	.003	.000	.262	.007
	N	88	88	88	88	88	88	88	88	88	88	88
Customer satisfaction	Pearson correlation	.711**	.734**	.523**	.550**	.783**	.416**	1	.718**	.690**	.306**	.471**
	sig.(2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.004	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Policy and strategic planning	Pearson correlation	.695**	.676**	.334**	.486**	.669**	.313**	.718**	1	.605**	.207	.335**
	sig.(2-tailed)	.000	.000	.001	.000	.000	.003	.000		.000	.052	.001
	N	88	88	88	88	88	88	88	88	88	88	88
Quality information system	Pearson correlation	.488**	.601**	.446**	.483**	.671	.490**	.690**	.605**	1	.441**	.539**
	sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Organisational culture	Pearson correlation	.210	.171	.253*	.326**	.280	.121	.306**	.207	.441**	1	.332**
	sig.(2-tailed)	.050	.111	.017	.002	.008	.262	.004	.052	.000		.002
	N	88	88	88	88	88	88	88	88	88	88	88
Suppliers relationship	Pearson correlation	.400**	.413**	.327**	.329**	.550	.284	.471**	.335**	.539**	.332**	1
	sig.(2-tailed)	.000	.000	.002	.002	.000	.007	.000	.001	.000	.002	
	N	88	88	88	88	88	88	88	88	88	88	88

Resource: data analysis results

The multiple regression model which fitted using backward elimination has independent variables of top management commitment, employees empowerment and training, customer satisfaction, policy and strategic planning and quality information systems after eliminating the least effective variables in this model (quality communication and structure, continuous improvement, quality measurement and benchmarking, quality information system and supplier relationships). Subsequently, the values of $R^2 = 0.752$ and $R^2_{adj} = 0.736$ for the market share model, as shown in table 6:20.

Table 6.20 Coefficients results of dependent variable market share

Coefficients a

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistic	
	B	Std. error	Beta			tolerance	VIF
1 (constant)	-.129	.280		-.462	.646		
Top management commitment	.396	.104	.334	3.807	.000	.393	2.544
Employee empowerment	.368	.065	.388	5.647	.000	.642	1.557
Customer satisfaction	.256	.121	.209	2.124	.037	.313	3.190
Policy and strategic planning	.225	.077	.248	2.922	.004	.422	2.369
Quality information system	-.187	.076	-.194	-2.450	.016	.483	2.070

b. Dependent variable: market share

Source: Data analysis result

As shown in table 6:20, the correlation coefficients between the ten independent variables and market share as the dependent variable show positive relationships at a significant level. Top management commitment (74.8%), empowerment (71.1%) and customer (71.1) are positively correlated with market share in a high level. Policy (69.5%), benchmarking (63.7%), communication (54%), information system (48.8) and suppliers (40%) are positively correlated with market share at a moderate level. Continuous improvement (23%) and organisational culture (21%) are positively correlated with market share at a small but definite level (refer to table 6:19).

The ANOVA table shows that F-statistic= 49.621 (p-value = 0.000) indicating that the multiple regression model with independent variables top management commitment, employees empowerment and training, customer satisfaction, policy and strategic planning and quality information systems is significant at 1% level in predicting the variability of market share, as shown in table 6:21.

Table 6.21 Market share ANOVA result

ANOVA a

Model	Sum of squares	df	Mean square	F	Sig.
1 Regression	23.291	5	4.658	49.621	.000a
Residual	7.698	82	.094		
Total	30.989	87			

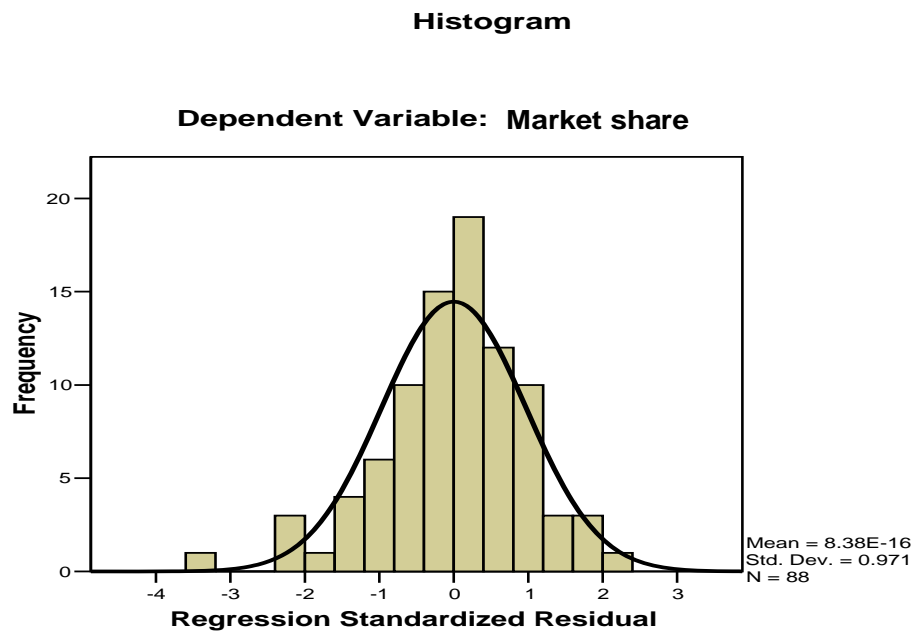
a. Predictors: (constant), quality information system, employee empowerment, policy and strategic planning, top management commitment, customer satisfaction.

b. Dependant variable: market share

Source: Data analysis result

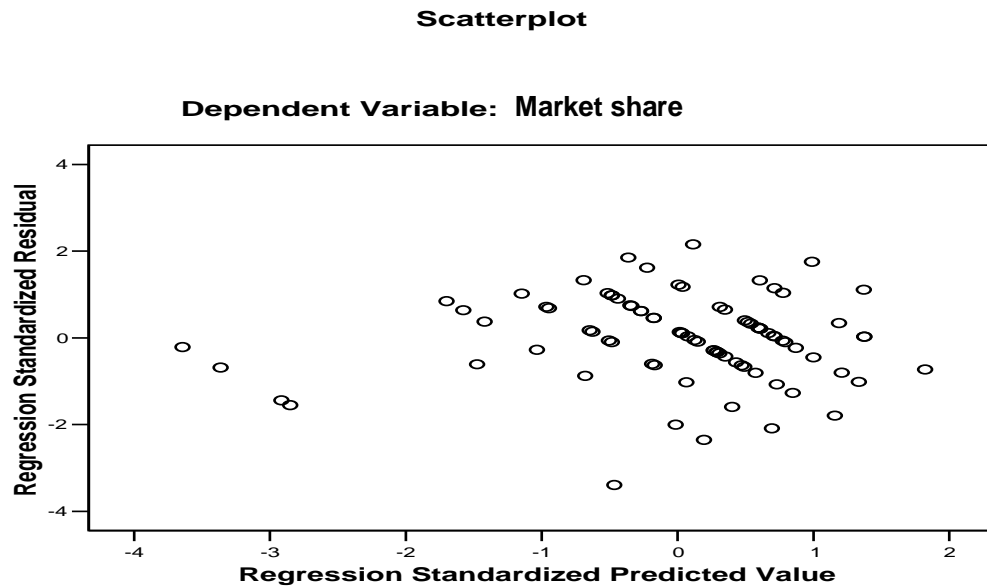
Residual analysis for backward elimination model

Figure 6.3 Second hypotheses residual analysis for backward elimination model



Source: Data analysis results

Figure 6.4 Second hypotheses residual analysis for backward elimination model



Source: Data analysis results

The diagram shows that residuals are approximately normally distributed around zero. The plot of the standardised residuals against the standardised predicted values is randomly distributed around zero, though, again, there are few values for lower predicted values. Five out of eighty eight of the standardised residuals are outside the range -2 to +2 (just over 5%) so this indicates that the level of error is acceptable. The residual analysis indicates that the model fits the data well.

According to the previous analysis, the H0 hypothesis is rejected since the regression analysis and Pearson's correlation coefficients show positive relationships between the quality management factors and market share, which means that H1 is fully accepted.

Finding from testing the third main hypothesis

H0: Total quality management implementation has no effect on effectiveness in the Jordanian ICT sector

H1: Total quality management implementation has a positive effect on effectiveness in the Jordanian ICT sector

Table 6:22 illustrates a correlation matrix which provides the value of the Pearson correlation coefficient between every pair of variables. After that the 2-tailed importance of each correlation is displayed. The number of cases contributing to each correlation ($N=88$) is shown in table 6:22 which also presents the correlation between independent variables (ten TQM factors) and the dependent variable (effectiveness).

Table 6.22 Correlation results

		effectiveness	TMC	QCS	EET	QMB	CI	CS	PSP	QIS	OC	SR
Effectiveness	Pearson correlation sig (2-tailed) N	1 .000 88	.828** .000 88	.484** .000 88	.548** .000 88	.736** .000 88	.417** .000 88	.775** .000 88	.595** .000 88	.674** .000 88	.333** .002 88	.336** .000 88
Top management commitment	Pearson correlation sig (2-tailed) N	.828** .000 88	1 .000 88	.543** .000 88	.542** .000 88	.705** .000 88	.342** .001 88	.734** .000 88	.676** .000 88	.601** .000 88	.171 .111 88	.413** .000 88
Quality communications structure	Pearson correlation sig (2-tailed) N	.484** .000 88	.543** .000 88	1 .000 88	.541** .000 88	.616** .000 88	.179 .096 88	.523** .000 88	.334** .001 88	.446** .000 88	.253* .017 88	.327** .002 88
Employ empowerment	Pearson correlation sig (2-tailed) N	.548** .000 88	.542** .000 88	.541** .000 88	1 .000 88	.547** .000 88	.169 .115 88	.550** .000 88	.486** .000 88	.483** .000 88	.326** .002 88	.329** .002 88
Quality measurement	Pearson correlation sig (2-tailed) N	.736** .000 88	.705** .000 88	.616** .000 88	.547** .000 88	1 .000 88	.415** .000 88	.783** .000 88	.669** .000 88	.671** .000 88	.280** .008 88	.550** .000 88
Continuous improvement	Pearson correlation sig (2-tailed) N	.417** .000 88	.342** .001 88	.179 .096 88	.169 .115 88	.415** .000 88	1 .000 88	.416** .000 88	.313** .003 88	.490** .000 88	.121 .262 88	.284** .007 88
Customer satisfaction	Pearson correlation sig (2-tailed) N	.775** .000 88	.734** .000 88	.523** .000 88	.550** .000 88	.783** .000 88	.416** .000 88	1 .000 88	.718** .000 88	.690** .000 88	.306** .004 88	.471** .000 88
Policy and strategic planning	Pearson correlation sig (2-tailed) N	.595** .000 88	.676** .000 88	.334** .001 88	.486** .000 88	.669** .000 88	.313** .003 88	.718** .000 88	1 .000 88	.605** .000 88	.207 .052 88	.335** .001 88
Quality information system	Pearson correlation sig (2-tailed) N	.674** .000 88	.601** .000 88	.446** .000 88	.483** .000 88	.671** .000 88	.490** .000 88	.690** .000 88	.605** .000 88	1 .000 88	.441** .000 88	.539** .000 88
Organisational culture	Pearson correlation sig (2-tailed) N	.333** .002 88	.171 .111 88	.253* .017 88	.326** .002 88	.280** .008 88	.121 .262 88	.306** .004 88	.207 .052 88	.441** .000 88	1 .000 88	.332** .002 88
Suppliers relationship	Pearson correlation sig (2-tailed) N	.366** .000 88	.413** .000 88	.327** .002 88	.329** .002 88	.550** .000 88	.284** .007 88	.471** .000 88	.335** .001 88	.539** .000 88	.332** .002 88	1 .000 88

Resource: data analysis results

Considering effectiveness as the dependent variable, it is positively correlated at 1% level of significance with all the predictor variables. In addition, the collinearity statistics show (table 6:23) VIF values ranging from 1.320 to 3.842, all well below 10, and tolerance values ranging from 0.260 to 0.757. None should be below 0.1. The average of the VIF values = 2.540 again indicates that multicollinearity problems may occur in this backward elimination model, so the coefficients of the variables cannot be interpreted through the regression model.

The multiple regression model which fitted using backward elimination, has independent variables of top management commitment, quality communications and structure, quality measurements and benchmarking, customer satisfaction, policy and strategic planning, quality information systems, quality culture and suppliers relationships, after eliminating the variables continuous improvement and empowerment. The backward elimination regression model shows that values of $R^2 = 0.811$ and $R^2 \text{ adj} = 0.792$.

Table 6.23 Dependents variable effectiveness coefficients

Coefficients a

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistic	
	B	Std. error	Beta			tolerance	VIF
1 (constant)	.010	.253		.040	.968		
Top management commitment	.588	.080	.606	7.379	.000	.356	2.813
Quality communication structure	-.085	.043	-.132	-1.994	.050	.550	1.819
Quality measurement	.289	.101	.275	2.863	.005	.560	3.842
Customer satisfaction	.267	.095	.266	2.820	.006	.270	3.703
Policy and strategic planning	-.160	.059	-.215	-2.718	.008	.382	2.617
Quality information system	.135	.062	-.171	2.167	.033	.387	2.584
Organisational culture	.133	.056	.134	2.386	.019	.357	1.320
Suppliers relationship	.144	.049	-.182	-2.918	.005	.616	1.623

Dependant variable: effectiveness

Source: Data analysis result

The ANOVA table shows an F-statistic= 42.312 (p-value = 0.000) indicating that the multiple regression model with independent variables of top management commitment,

quality communications and structure, quality measurements and benchmarking, customer satisfaction, policy and strategic planning, quality information systems, quality culture and suppliers relationships is significant at 1% level in predicting the variability of effectiveness.

Table 6.24 Effectiveness ANOVA result

ANOVA b

Model	Sum of squares	df	Mean square	F	Sig.
1 Regression	16.912	8	2.114	42.312	.000a
Residual	3.947	79	.050		
Total	20.859	87			

a. Predictors: (constant), supplier relationship, quality communication and structure, organisational culture, policy and strategic planning, quality information system, top management commitment, customer satisfaction, quality measurement and benchmarking.

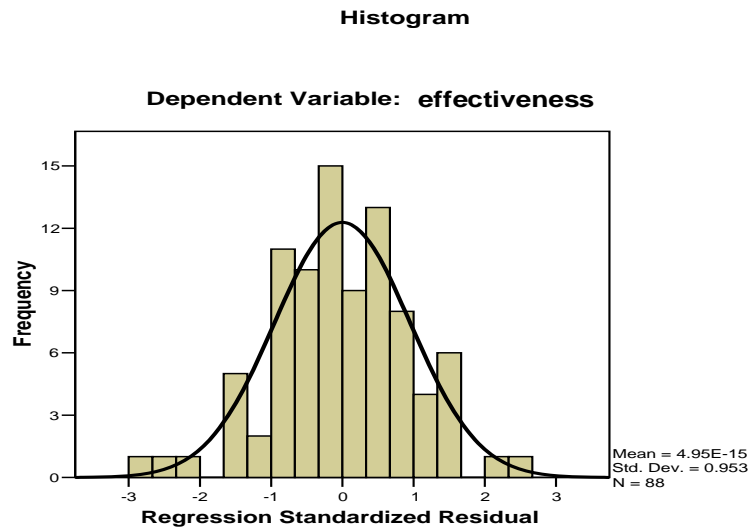
b. dependant variable: effectiveness

Source: Data analysis result

Pearson's correlation matrix (table 6:22) indicated that all the independent variables are positively correlated with effectiveness as a dependent variable in a highly significant level. Commitment (82.8%), customer satisfaction (77.5%) and benchmarking (73.6%) are positively correlated with effectiveness in a high level. Quality information system (67.4%), policy (59.5%), empowerment (54.8%), quality communication (48.4%) and continuous improvement (41.7%) are correlated with effectiveness in a moderate level. Suppliers (36.6%) and organisational culture (33.3%) are correlated with effectiveness in a small but definite level (refer to table 6:22).

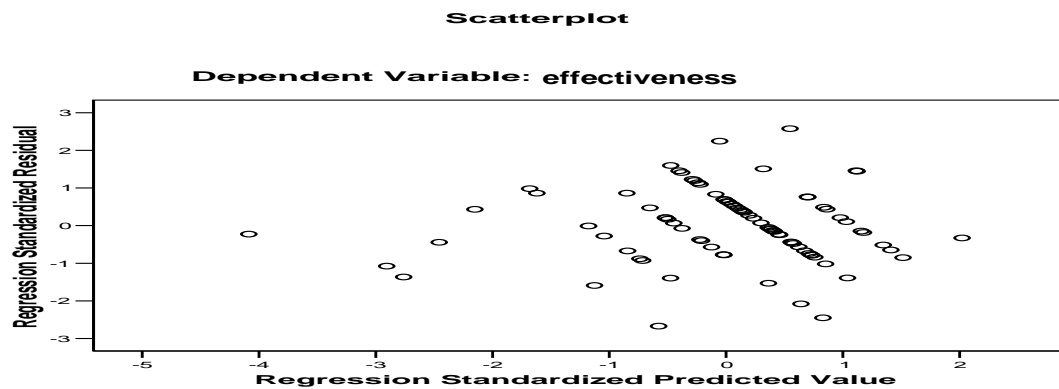
Residual analysis for backward elimination model

Figure 6.5 Third hypotheses residual analysis for backward elimination model



Source: Data analysis results

Figure 6.6 Third hypotheses residual analysis for backward elimination model



Source: Data analysis results

The plot of the standardised residuals against the standardised predicted values is reasonably randomly distributed around zero though, again, there are few values for lower predicted values. Five out of eighty eight of the standardised residuals are outside the range -2 to +2 (just over 5%), therefore this indicates that the level of error is acceptable. The residual analysis indicates that the model fits the data well.

Through this analysis, it is concluded that H0 is rejected because regression and Pearson's correlation analyses indicate a positive relationship between the quality management factors and effectiveness, which supports that H1 is fully accepted and the positive relationship is statistically approved.

Finding from testing the fourth main hypothesis

H0: Total quality management implementation no effect on service quality in the Jordanian ICT sector

H1: Total quality management implementation has a positive effect on service quality in the Jordanian ICT sector

Table 6:25 shows a correlation matrix which presents the value of the Pearson correlation coefficient between every pair of variables. After that the 2-tailed significance of each correlation is displayed. Finally, the number of cases contributing to each correlation ($N=88$) is shown.

Considering service quality as a dependent variable, it is positively correlated at 1% level of significance with all the predictor variables except suppliers which is correlated at the 5% level. In addition, the collinearity statistics show (table 6:26) VIF values ranging from 1.320 to 3.842, all well below 10, and tolerance values ranging from 0.260 to 0.757. None should be below 0.1. The average of the VIF values = 2.540 again indicating that multicollinearity problems may occur in backward elimination model, so the coefficients of the variables can not be interpreted through regression analysis.

Table 6.25 correlation result

		Service quality	TMC	QCS	EET	QMB	CI	CS	PSP	QIS	OC	SR
Service quality	Pearson correlation	1	.532**	.275**	.418**	.572**	.335**	.608**	.386**	.587**	.466**	.258*
	sig.(2-tailed)		.000	.010	.000	.000	.001	.000	.000	.000	.000	.015
	N	88	88	88	88	88	88	88	88	88	88	88
Top management commitment	Pearson correlation	.532**	1	.543**	.542**	.705**	.342**	.734**	.676	.601**	.171	.413**
	sig.(2-tailed)	.000		.000	.000	.000	.001	.000	.000	.000	.111	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Quality communications structure	Pearson correlation	.275**	.543**	1	.541**	.616**	.179	.523	.334**	.446**	.253**	.327**
	sig.(2-tailed)	.010	.000		.000	.000	.96	.000	.001	.000	.017	.002
	N	88	88	88	88	88	88	88	88	88	88	88
Employ empowerment	Pearson correlation	.418**	.542**	.541**	1	.547**	.169	.550**	.486**	.483**	.326**	.329**
	sig.(2-tailed)	.000	.000	.000		.000	.115	.000	.000	.000	.002	.002
	N	88	88	88	88	88	88	88	88	88	88	88
Quality measurement	Pearson correlation	.572**	.705**	.616**	.547**	1	.415**	.783**	.669**	.671**	.280**	.550**
	sig.(2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.002	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Continuous improvement	Pearson correlation	.335**	.342**	.179	.169	.415**	1	.416**	.313**	.490**	.121	.284**
	sig.(2-tailed)	.001	.001	.096	.115	.000		.000	.003	.000	.262	.007
	N	88	88	88	88	88	88	88	88	88	88	88
Customer satisfaction	Pearson correlation	.608**	.734**	.523**	.550**	.783**	.416**	1	.718**	.690**	.306**	.471**
	sig.(2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.004	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Policy and strategic planning	Pearson correlation	.386**	.676**	.334**	.486**	.669**	.313**	.718**	1	.605**	.207	.335**
	sig.(2-tailed)	.000	.000	.001	.000	.000	.003	.000		.000	.052	.001
	N	88	88	88	88	88	88	88	88	88	88	88
Quality information system	Pearson correlation	.587**	.601**	.446**	.483**	.671**	.490**	.690	.605**	1	.441**	.539**
	sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	88	88	88	88	88	88	88	88	88	88	88
Organisational culture	Pearson correlation	.466**	.171	.253*	.326**	.280**	.121	.306**	.207	.441**	1	.332**
	sig.(2-tailed)	.000	.111	.017	.002	.008	.262	.004	.052	.000		.002
	N	88	88	88	88	88	88	88	88	88	88	88
Suppliers relationship	Pearson correlation	.258*	.413**	.327**	.329**	.550	.284**	.471**	.335**	.539**	.332**	1
	sig.(2-tailed)	.015	.000	.002	.002	.000	.007	.000	.001	.000	.002	
	N	88	88	88	88	88	88	88	88	88	88	88

Resource: data analysis results

The multiple regression model which fitted using backward elimination, has independent variables top management commitment, quality communications and structure, quality measurements and benchmarking, customer satisfaction, policy and strategic planning, quality information systems, quality culture and suppliers relationships, after eliminating the factors continuous improvement and employees empowerment, with values of $R^2 = 0.612$ and $R^2_{adj} = 0.573$.

Table 6.26 Dependent variable service quality coefficient

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistic	
	B	Std. error	Beta			tolerance	VIF
1 (constant)	.310	.388		.799	.427		
Top management commitment	.334	.122	.322	2.741	.008	.356	2.813
Quality communication structure	-.215	.065	-.311	-3.291	.001	.550	1.819
Quality measurement	.471	.154	.419	3.051	.003	.560	3.842
Customer satisfaction	.354	.154	.329	2.441	.017	.270	3.703
Policy and strategic planning	-.296	.090	-.372	-3.283	.002	.382	2.617
Quality information system	.215	.095	-.255	2.260	.027	.387	2.584
Organisational culture	.349	.085	.330	4.096	.000	.357	1.320
Suppliers relationship	-.237	.075	-.281	-3.146	.002	.616	1.623

Dependent variable: service quality

Source: Data analysis results

The ANOVA table shows an F-statistic= 15.597 (p-value = 0.000) indicating that the multiple regression model with independent variables of top management commitment, quality communications and structure, quality measurements and benchmarking, customer satisfaction, policy and strategic planning, quality information systems, quality culture and suppliers relationships is significant at 1% level in predicting the variability of service quality.

Table 6.27 Service quality ANOVA result**ANOVA^b**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.583	8	1.823	15.597	.000 ^a
	Residual	9.233	79	.117		
	Total	23.816	87			

a. Predictors: (constant), suppliers relationship, quality communication and structure, organisational culture, Policy and strategic planning, quality information system, top management commitment, customer satisfaction, quality measurement and benchmarking.

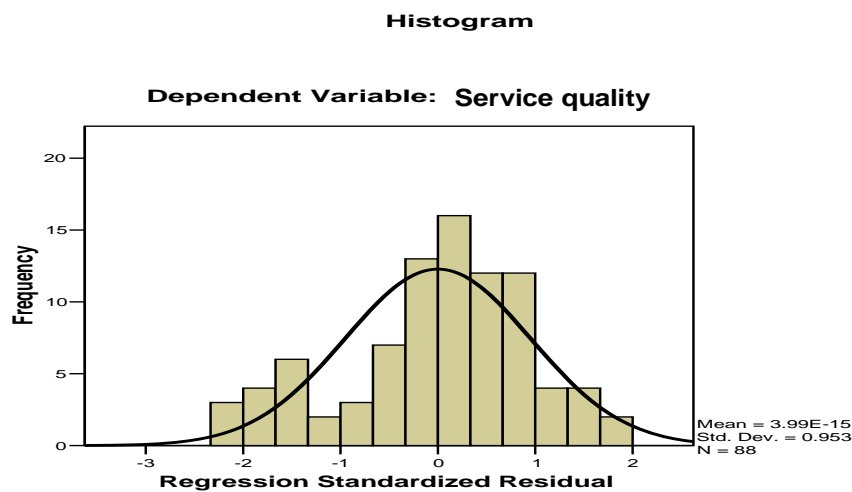
b. Dependent variable: service quality

Source: Data analysis results

Pearson's correlation matrix (table 6:25) indicated that all the independent variables are positively correlated with service quality as a dependent variable at a significant level. Customer (60.8%), quality information system (58.7), benchmarking (57.2%), commitment (53.2%), organisational culture (46.6%) and empowerment (41.8) are correlated with service quality in a moderate level. Policy (38.6%), improvement (33.4%), communication (27.5) and suppliers relationships (25.8) are correlated with service quality in a small but definite level (refer to table 6:25).

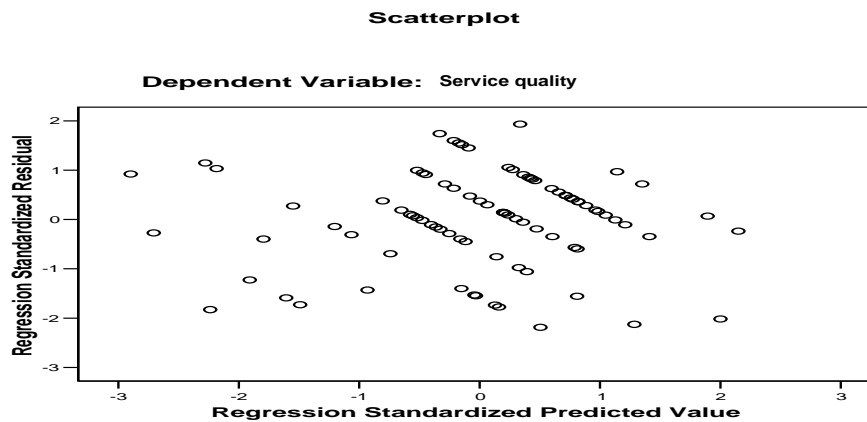
Residual analysis for backward elimination model

Figure 6.7 Fourth hypotheses residual analysis for backward elimination model



Source: Data analysis results

Figure 6.8 Fourth Hypotheses residual analysis for backward elimination model



Source: Data analysis results

Residuals are approximately normally distributed, though not so close to normal as in the previous two models, the mean is very close to zero. The plot of the standardised residuals against the standardised predicted values is randomly distributed around zero. Three out of eighty eight of the standardised residuals are outside the range -2 to +2 (just over 3%) so this indicates that the level of error is acceptable. The residual analysis indicates that the model fits the data well.

Based on this analysis, it is proved that H_0 is rejected since positive relationships between the quality management factors and service quality are evident which indicates that H_1 is fully accepted.

6.4.2.2 Significant difference across companies: business type and company size

Using Pearson's correlation co-efficient test, the correlations between the independent variables (the ten TQM factors) and the dependent variables, which represent the

competitiveness of the companies, were tested considering the variables of company class and company size to illustrate the significant difference.

Table 6.28 Ten TQM factors Pearson correlation result

TQM factors		Internet	Cell	Land+others
top management commitment	Pearson Correlation	0.86	0.71	0.90
	Sig. (2-tailed)	0.00	0.00	0.00
	N	33	30	25
quality communications and structure	Pearson Correlation	0.66	0.48	0.24
	Sig. (2-tailed)	0.00	0.01	0.25
	N	33	30	25
employees empowerment and training	Pearson Correlation	0.70	0.57	0.72
	Sig. (2-tailed)	0.00	0.00	0.00
	N	33	30	25
quality measurements and benchmarking	Pearson Correlation	0.76	0.73	0.78
	Sig. (2-tailed)	0.00	0.00	0.00
	N	33	30	25
continuous improvement	Pearson Correlation	0.51	0.06	0.49
	Sig. (2-tailed)	0.00	0.75	0.01
	N	33	30	25
customer satisfaction	Pearson Correlation	0.81	0.83	0.84
	Sig. (2-tailed)	0.00	0.00	0.00
	N	33	30	25
policy and strategic planning	Pearson Correlation	0.77	0.35	0.71
	Sig. (2-tailed)	0.00	0.06	0.00
	N	33	30	25
quality information systems	Pearson Correlation	0.75	0.57	0.63
	Sig. (2-tailed)	0.00	0.00	0.00
	N	33	30	25
organisational culture	Pearson Correlation	0.39	0.45	0.24
	Sig. (2-tailed)	0.02	0.01	0.25
	N	33	30	25
suppliers relationships	Pearson Correlation	0.51	0.18	0.46
	Sig. (2-tailed)	0.00	0.34	0.02
	N	33	30	25

Regarding the correlation between the ‘company class’ which represents the type of services presented by the companies, table 6:28 indicates that the Internet companies have the highest correlation with the dependent variables in terms of six TQM factors: top management commitment, quality communications and structure, continuous improvement, policy and strategic planning, quality information systems and suppliers

relationships; while, the cellular companies show the lowest correlation with the dependent variables, especially with continuous improvement, policy and strategic planning and suppliers relationships.

A company's size was measured by the number of employees working in its body. The 'small-sized' had less than 100; while 'large-sized' companies had more than 100 employees.

Table 6.29 The correlation between TQM factors and competitiveness

TQM factors		Small companies	Large companies
top management commitment	Pearson Correlation	0.80	0.88
	Sig. (2-tailed)	0.00	0.00
	N	56	32
quality communications and structure	Pearson Correlation	0.46	0.59
	Sig. (2-tailed)	0.00	0.00
	N	56	32
employees empowerment	Pearson Correlation	0.52	0.83
	Sig. (2-tailed)	0.00	0.00
	N	52	32
quality measurements and benchmarking	Pearson Correlation	0.77	0.72
	Sig. (2-tailed)	0.00	0.00
	N	56	32
continuous improvement	Pearson Correlation	0.36	0.41
	Sig. (2-tailed)	0.01	0.02
	N	56	32
customer satisfaction	Pearson Correlation	0.81	0.80
	Sig. (2-tailed)	0.00	0.00
	N	56	32
policy and strategic planning	Pearson Correlation	0.57	0.72
	Sig. (2-tailed)	0.00	0.00
	N	56	32
quality information systems	Pearson Correlation	0.68	0.68
	Sig. (2-tailed)	0.00	0.00
	N	56	32
organisational culture	Pearson Correlation	0.36	0.40
	Sig. (2-tailed)	0.01	0.02
	N	56	32
suppliers relationships	Pearson Correlation	0.28	0.54
	Sig. (2-tailed)	0.04	0.00
	N	56	32

Table 6:29 shows that there is greater correlation between the TQM factors and the competitiveness of the companies in the large companies than in the small ones, which indicates that TQM application in the large companies is higher than in the small companies, based on these results.

Interviews findings

The interviews were undertaken with 16 general managers and TQM managers. As mentioned before (see the methodology chapter 5.9.2.1) the interview was built on 4 main questions. While the last parts of the research discussed the first three questions, this part of the research discusses the following question: What does the company obtain from the competitiveness in the market place as a result of implementing TQM in its body?

The general managers and TQM managers considered 4 main dimensions which were mentioned in the questionnaire:

1. profitability
2. service quality
3. effectiveness
4. market share.

In addition to these four dimensions, the general managers and TQM managers added another one which is reputation. Table 6:30 provides more detail of the collected data.

Table 6.30 interview result regarding the impact of TQM on competitiveness

Dimensions	Mentioned number	%
Profitability	13	81.25
Service quality	12	75
Effectiveness	10	62.5
Market share	8	50
Reputation	7	43.75

Source: Data analysis result

As shown in table 6:30, profitability recorded the highest percentage with 81.25%, while reputation recorded the lowest percentage with 43.75%. Market share had a percentage recorded at 50%, while, on the other hand, service quality recorded 75%. The result of the table emerged from analysing the recorded interviews.

6.4.3 The third objective is to explore the role of the environmental factors to encourage the implementation and sustaining of TQM in the Jordanian context

The reason behind this part is to illustrate the role of the environmental factors that take effect when applying TQM implementation to the Jordanian context. It can be shown from the conducted research that there are many environmental factors which play significant roles at TQM implementation.

The data collection methodologies employed by the researcher to serve this objective were the quantitative and qualitative approaches. The next section deals with the questionnaires used to produce the findings.

Questionnaire findings

The questionnaires were distributed to the general managers, TQM managers and the employees in the Quality Management Departments (QMD) at the selected companies. The questionnaire was built on a five- point Likert scale and focused on the government's expected role in implementing TQM factors in the companies and the social culture role. Table 6:31 shows the results of the questions regarding government roles.

Table 6.31 the government roles in encouraging TQM implementation

No	Statements	Mean	STD. DeV
1	the role of the governmental taxation low in increase the real implementation to the TQM factors at the companies	2.94	.764
2	The governmental procedures such as rewarding the companies that applied TQM and the individuals who are willing to apply the TQM approach	4.11	.828
3	Governmental regulator specify the minimum level of quality service which must be provided by the company to meet the customer's needs and protect their expectations government roles	3.83	.805
	Government roles	3.62	.506

Source: Data analysis result

Table 6:31 shows that *The governmental procedures such as rewarding the companies that applied TQM and the individuals who are willing to apply the TQM approach* has recorded the highest rate of 4.11 while *Government regulations specify the minimum level of quality service which must be provided by the company to meet the customer's needs and protect their expectations* obtained the second highest rate of 3.83 and *The government policy of imposing taxation encourages TQM implementation in companies* recorded the lowest rate with a mean of 2.94.

As an alternative aspect to the government roles, the questionnaire has treated the social culture factors as another main aspect which effects the implementation of TQM factors. Table 6:32 introduces the data collected in more detail.

Table 6.32 the role of social culture in encouraging TQM implementation

No	Statement	Mean	STD. DeV
1	The educational institutions at the local community provide the companies with well educated staff who is able to provide high TQM implementation	3.84	.843
2	The local community's culture demands a continuous development of customers' service quality	3.16	.771
3	The social culture focused on product's quality and services provided by the company more than the price.	3.06	.975
	social culture	3.35	.651

Source: Data analysis result

As illustrated in table 6:32 *The education authorities in the local community provide the companies with well educated staff who are able to provide high quality TQM implementation* has recorded the highest rate with 3.84. On the other hand, *The local community's culture demands a continuous development of customer services quality* recorded the second highest rate with 3.16. Finally, the lowest rate was recorded by *The social culture focused on product quality and services provided by the company more than the price* with 3.06.

To sum up, the last section has provided an explanation of the questionnaire findings which show that the government and social culture have positive roles in TQM implementation in ICT companies within the Jordanian context.

Interviews findings

This section provides the data collected by face-to-face semi-structured interviews that had been undertaken with the general managers, TQM managers and 45 regular customers at the ten largest companies. General and TQM managers were asked about the expected external aspects that encourage and affect positively on TQM implementation in their companies.

Table 6:33 shows the external environment elements which encourage and effect positively on TQM implementation. The interview findings reported that *Government reward* is considered by the participants as the most effective element in encouraging TQM implementation within Jordanian ICT companies. It recorded the highest number of repeated mentions in 12 out of 16 interviews and the percentage reached 75%. 11 out of 16 participants mentioned the role of *Government quality standardization* in TQM implementation. Also, the role of educational institutions in providing well educated staff was mentioned by 10 participants.

On the other hand, the participants mentioned the negative elements that discourage TQM implementation. These negative elements are presented in table 6.34 The element *The government policies that are related to giving the licences to new companies* is reported by the interviewees as being the most negative to discourage TQM implementation in Jordanian ICT companies. It is mentioned by 14 out of 16 participants. 11 out of 16 participants mentioned the negative role of *Government policies that are related to the taxation* in TQM implementation in the Jordanian ICT companies. Both the *local community does not demands a continuous development of service quality* and *The local community culture is highly considered with the price* recorded 10 and 9 frequencies, respectively.

Table 6.33 interview findings regarding the positive and negative aspects effect on TQM implementation

Positive aspect	Mentioned number	%
Government reward	12	75
The governmental quality standardization	11	68.75
The educational institutions at the local community provide the companies with well educated staff who is able to provide high TQM implementation	10	62.5
Negative aspect		
The local community doesn't demands a continuous development of service quality	10	62.5
The local community culture is highly considered with the price	9	56.25
New licences to new companies in the market	14	87.5
The governmental policies that are related to the taxation	11	68.75

Source: Data analysis result

In order to obtain a clear and comprehensive view of the role of the external environment in applying TQM the researcher interviewed customers who were considered to be the most significant element of the companies external environment. 45 regular customers were interviewed and asked whether they give priority to the price or to the quality of the service when they purchase or subscript the Jordanian ICT companies' products and services. The results of these interviews revealed that 23 out of 45 customers give priority to price, while 22 give priority to product quality.

6.4.4 Fourth objective: To identify the main impediments of the adoption of TQM in the Information and Communication Technology ICT sector in Jordan

Questionnaire findings

The most important obstacle which prevents TQM implementation in Jordanian ICT companies from the respondents' perspective was *Weakness of the attention to total*

quality culture as shown in table 6.34. These obstacles have been formulated from TQM factors used within the study as independent variables. The respondents were asked to arrange those ten obstacles from the most to the least effective factor according to which degree it prevents the success of adopting TQM in their companies. Those factors were numbered from (1) for the most effective factors through to (10) for the least effective factor.

Table 6.34 the questionnaire results regarding TQM implementation impediments

No	Factors	Frequency	Arrangement
1	Weakness of attention to total quality culture	20	1
2	Weakness of commitment in employee empowerment and training programmes	13	2
3	Weakness of commitment of the top management in achieving continuous development	11	3
4	Weakness of the attention to the supply chain relationship	3	9
5	Weakness of focusing on customer satisfaction and their expectations	8	5
6	Weakness of commitment to total quality strategy requirements	2	10
7	Lack of top management commitment and belief in the programmes of TQM	6	7
8	Lack of use of quality measurement and benchmarking	9	4
9	Poor organisational communication	7	6
10	Inefficient information systems used in the company	5	8

Source: Data analysis result

Table 6:34 illustrates that *Weakness of the attention to total quality culture* is the major problem and the most effective factor which prevents adopting TQM in ICT companies in Jordan; it appeared 20 times. However, the rest of the factors have been arranged from the most to the least effective factor according to which degree it prevents the success of adopting TQM: *Weakness of commitment in employee empowerment and training programmes* had 13 frequencies; *Weakness of commitment of the top management in*

achieving continuous development had 11 frequencies; *Lack of use of quality measurement and benchmarking* had 9 frequencies; *Weakness of focusing on customer satisfaction and their expectations* had 8 frequencies; *Poor organisational communications* had 7 frequencies; *Lack of top management commitment and belief in the programmes of TOM* had 6 frequencies; *Inefficient information systems used in the company* had 5 frequencies; *Weakness of attention to the supply chain relationship* had 3 frequencies; *Weakness of commitment to the quality strategy requirements* had 2 frequencies.

Interview findings

Semi-structured interviews were conducted with general and TQM managers in Jordanian ICT companies. Managers were asked about the main impediments of adopting TQM in their companies. Interviewees were not required to rank order or rate the impediments; the relevant measure was simply the number of times any given impediments were mentioned. *Culture*, as reported in Table 6:36, headed the list, mentioned by fourteen out of sixteen interviewees, followed by *Empowerment and training* reported by eleven interviewees, then *Continuous development* was reported by ten interviewees, *Poor communications* was reported by eight interviewees, *Weakness of focusing on customer satisfaction* was reported by six interviewees and *Quality measurement and benchmarking* was reported by five interviewees. However, the rest of the impediments mentioned in the questionnaire were reported by less than four interviewees. *The government* and *insufficient finance* are other impediments which emerged from the interviews which the researcher did not mention in the questionnaire.

Table 6.35 The interview results regarding TQM implementation impediments

TQM impediments	Number of mentions	%
Culture	14	87.5
Empowerment and training	11	68.75
Continuous development	10	62.5
Communication	8	50.0
Focusing on customer satisfaction	6	37.5
Quality measurement and benchmarking	5	31.25
information system	4	25.0
Finance	4	25.0
Government	3	18.75
Top management commitment	3	18.75
Supplies	2	12.50
Strategy requirements	1	6.25

Source: Data analysis result

6.5 Chapter summary

This chapter has presented and analysed the findings of the data collected by questionnaires and semi-structured interviews. The descriptive analysis of the data is the first statistical technique used to provide a summary of the respondents' and their companies' demographic characteristics using means, frequencies and standard deviation. Multiple regressions is another statistical analysis which was used to produce the adjusted R^2 , R, F and P values that were advantageous for testing the hypotheses. It is used to test the relationship between the TQM implementation factors and company competitiveness. Multicollinearity examining, the collinearity diagnostics (the variance inflation factor (VIF) and, tolerance) and the backward elimination method are the other statistical techniques used in the present study. The data obtained from the interviews was processed and analysed by using the thematic analysis approach in order to explain

and support the results that emerged from the questionnaire. A discussion of the results of the previous findings analysis will be presented in the next chapter.

The results revealed that TQM success factors were identified and proved statistically as: top management commitment, employee training, quality measurement and benchmarking, customer satisfaction, quality information system, policy and strategic planning, and suppliers' relationships. In addition, there is an impact of TQM implementation as an independent variable on improving companies' competitiveness as the dependent variable. Also, it is found that the government policy acts as an encouraging factor to implement TQM successfully but it has some discouraging factors, such as taxation policy. Social culture is likely to have a negative impact on TQM implementation. Moreover, TQM implementation impediments were identified as inappropriate organisation culture, lack of employee empowerment, the weakness of continuous improvement and the government role through licensing policy and bureaucracy.

Chapter Seven

Discussion of Overall Quantitative and Qualitative Data and Findings

7.1 Introduction

This chapter aims to discuss the findings and results that have emerged from the data presented in chapter 6. It presents interpretation, triangulation and reflection of the quantitative and qualitative results presented in chapter 6. Furthermore, comparative and related studies have been introduced, especially those that have been conducted in developing countries, particularly in Jordan.

At the beginning, the characteristics of the sample, the respondents and the participant companies are identified. Then the objectives that are related to TQM implementation are discussed. The overall aim of this study is to investigate the current status and subsequently to develop a model to assist the implementation, of TQM in ICT companies in Jordan. In order to achieve this aim, the research objectives were developed:

- an assessment of the adoption of TQM factors in the ICT companies,
- the impact of TQM implementation in improving the ICT companies' competitiveness,
- the role of external environmental factors that encourage TQM implementation and sustainability, which are the governmental policy and social culture,
- the impediments that hamper TQM implementation in the ICT companies in Jordan.
- the fifth objective identified in Section 1.3 is addressed in Section 8.4 and supported further in Section 8.5.

The structure that the researcher adopted to discuss the research objectives was built on three stages. Each objective is discussed separately and the key's finding for each objective are identified

- Present the collected data from the questionnaires.
- Present the findings of the interviews.
- Evaluate the emerged results with the TQM literature.

7.2 Characteristics of the sample: respondents and companies

This section aims to discuss the representation of the sample to the entire population.

7.2.1 The participants' gender, age and education levels

An observer of the business and management studies which have been undertaken in Jordan would obviously find that the percentage of men in the workforce usually records double or more than that of females (Al-Qudah 2006, Altarawneh 2005, AL khattab, 2006), which match the findings of this study. It was found that 73.9% of the participants were male, while 26.1% were female. This result reflects that the majority of employees in ICT companies in Jordan are male.

There are two main reasons for these results. Firstly, the Arabic culture depends on the males in the social structure as financial suppliers to the household, while, in the Arabic social structure, the females still carry out the child-caring and housekeeping responsibilities, although the Jordanian government supports the female worker's right, as The Arab Human Development Report (2005, p, 4) stated: "*The Jordanian and Egyptian constitutions and labour laws in some other states explicitly prohibit gender discrimination in the workplace*". Secondly, women tend to accept more traditional secretarial jobs. Moreover, most of the females in the Arab world in general, and Jordan in particular, tend to work in the health or education sectors, probably due to having less contact with men, which is consistent with Islamic culture (ALdahhan, 1988, Zioud, 1997).

In addition, Atiyyah (1993) classified the style of Arab managers in two types: traditional and modern. The traditional style is characterized by the refusal to employ females. However, it is fair to say that women in Jordan have reached an advanced level in life style and education when compared to the current situation of women in many other Arabic countries.

Observing the participants' age, the study shows that 37.5% of them are aged between 31 and 40, 31.8 % between 20 and 30, 25.5% between 41 and 50 and 5.7% are more than 50. The researcher believes that the age group between 31 and 40 was recorded as the highest rate for two main reasons. Mainly, young people in Jordan complete their study aged between 22 and 25; moreover, they need between 4 and 7 years of extra practical experience in the ICT sector in Jordan. Secondly, general managers in ICT mostly prefer to employ experts in their organizations rather than the inexperienced people who are usually too young (the current empirical study).

Pointing out the participants' education level, this study shows that the majority of General managers, TQM managers and TQM employees in ICT companies possess bachelor's degrees (83 % of the respondents), while 15.9 % of the participants have postgraduate qualifications (Masters and PhD). The indication of this research is that the respondents in ICT companies in Jordan are well-educated people. Moreover, the selected companies have had considerable interest in recruiting people who hold at least a university degree (the current empirical study). Based on that, it could be indicated that educational level is considered as one of the most significant requirements for working in Jordanian ICT companies. Al-Faleh (1987) pointed out that a bachelor's degree is becoming the minimum academic qualification for the appointment to senior posts, principally in large Jordanian companies.

7.2.2 The participants' work experience in the field of TQM

This study shows that the highest percentage (42%) of the people have work experience of between 3 and 6 years, while the lowest percentage (14.8%) have work experience of more than 10 years. In between, 22.7% of the people had less than 3 years' experience while (20.5 %) had between 7 and 10 years. This result could refer to, the fact that ICT in a modern sector in Jordan and more likely to employ people with not too much experience.

7.2.3 The participants' job titles

Exploring the current characteristics of the people who were in charge of TQM activities in Jordanian ICT companies was a significant requirement for achieving the research objectives because they were the main issues to assist the researcher with answering the research questions. As explained in the methodology chapter, the respondents were General managers, TQM managers and TQM employees. These people are responsible for implementing TQM activities in their organisations. This idea matches AL-Marri et al's (2007) thoughts in their study. These scholars adopted the idea that quality managers' perspectives are considered the main source of the information because they are directly responsible for planning and implementing TQM.

Moreover, Madu et al. (1996) argued that TQM managers and employees are good sources of information relating to quality practice within their company because they are the decision makers of the top management, they interact at both top and lower management levels and they are able to understand the performance of their companies as well as the reactions of low level employees in relation to quality practice. In addition, they are the people who are most able to understand quality related problems that may affect the company and are in possession of the right information to respond to a quality related questionnaire.

From the findings it has been found that 11.4 % of the participants classified their job status as TQM managers, while 26.1% of the participants classified their job status as general manager and 62.5 % were employees in TQM departments. The results show that only 10 companies in the sample have the position of TQM manager, which reflects the limitation that not all the companies have a TQM department. That seems to be reasonable because during the empirical study the researcher targeted these managers and TQM employees for providing the primary data.

7.2.4 The ownership of the participant companies

The collected data shows that 79.5% of the companies are private while 20.5 % of them are public shareholding companies. Awamleh (2002) mentioned that the privatization programme in Jordan is almost completely implemented in telecommunications companies.

7.2.5 Region (Market)

The fundamental purpose of this section is to illustrate the regional spans (distribution) of the Jordanian companies. It has emerged from this research that ICT companies in Jordan are spread across four main regions. First, local companies are those which expand their services internally so they only provide their services to the local Jordanian market. These companies are recorded as 45.5% in the empirical study. The researcher explains this in two ways. First, the government's policy encourages the establishing of local companies rather than regional or international companies. Second, the Jordan economy is relatively poor in the international market place; therefore it is unable to compete (Awamleh, 2002).

Regional companies distribute their services to the markets closest to the Jordanian market such as Syria. It was shown that 2.3% of companies operated regionally. It was also seen that 43.2% of companies operated regionally and locally. Finally, international

companies have a wider vision for their business and services. 9.1% of companies are initially international companies but they provide their services to the Jordanian community.

7.2.6 Standardizations

The term standardization is used in ICT companies in Jordan to measure the quality of the companies' services. Applying ISO in ICT companies is considered as a significant sign that allows the ICT companies to implement the TQM strategy. Zairi (1996) stated that many Middle Eastern countries put more emphasis on applying the ISO certificate as a fundamental tool that enables maximisation of the possible benefits of applying TQM principles. Furthermore, Chapman and Al-Khawaldeh, (2002) emphasised the importance of ISO certification as being an excellent foundation for achieving total quality in Qatar.

The researcher observed the current situation for applying ISO in ICT companies by undertaking an empirical study and found that 92 % of the companies work within the ISO standardization and hold certificates of international specification in the area of quality of various international institutions. It could follow that ICT companies in Jordan are seeking to apply the TQM strategy and the principles for introducing it. On the other hand, 8% of the selected companies are working within Jordanian standardization. This standardization was established by the Jordan Institution for Standards and Metrology. Jordanian standardization aims to increase the quality of local products by the adoption of appropriate Jordanian standards in order to enhance their competitiveness in the local and international markets and, thus, support the national economy. It also aims to grant conformity of certificates, including the quality mark (Jordan Institution for Standards and Metrology, 2007)

7.2.7 Number of employees

There were two main reasons for introducing the number of employee at this stage.

- To classify the companies' categories, by using the size as main measurement standard. The researcher classified the ICT companies in two main categories: large companies that have more than 100 employees; small companies that have less than 100 employees. Khalifa and Aspinwall (2000) adopted the same method of classification when they used the number of the employee to measure the companies' size and classified companies with less than 100 as small.
- To illustrate the impact of TQM implementation on the companies' competitiveness based on the companies' size.

It was reported that 63.6 % of the participants considered that their companies are large, with more than 100 employees. These large companies have a General manager, TQM managers and a number of employees who work in the TQM department. On the other hand, 36.4 % of the ICT companies are considered as small, with fewer than 100 workers. The researcher observed that, usually, small companies do not have a TQM managers and a TQM department (researcher observation).

7.2.8 Companies business type

In this section the researcher presents the ICT companies' business types based on the companies' services. The researcher found that Jordanian ICT companies could be classified according to the business types, such as IT, mobile and ICT which is also the Regulate Communication Organization's classification in 2006.

The characteristics of the sample employed in this research only part reflect the researcher's populations that are all the ICT sector's companies licensed by Telecommunications Regulatory Commission organisation classification in 2006. The researcher adopted this classification to illustrate the impact of the business type on the companies' competitiveness when they apply TQM strategy.

The collected data shows that the highest percentage (37.5 %) was recorded in the companies specializing in data communications services (Internet companies) which means that the majority of the companies in the ICT sector are Internet companies. The group of companies with the next highest percentage (34.1%) was that which provides mobile telephone services or what is known as cellular companies. The companies specializing in land telephones, paging, pre-paid cards services, radio trucking and global mobile “satellite” had the lowest percentage (28.4%). This result illustrates that some companies have a monopoly for providing a specific service in the Jordanian market, for example, only one company in Jordan provides a land telephone service.

7.3 Discussion of the findings

7.3.1 First objective: To assess the adoption of TQM in the ICT sector in Jordan.

The aim of this part of the discussion is to illustrate and evaluate the findings which emerged from the empirical study that reflect the implementation of the ten TQM factors that have been adopted in the ICT sector in Jordan. The structure adopted in this section was built on five stages:

- divide and discuss each factor separately
- present the key finding
- introduce the collected data from the distributed questionnaire
- introduce the interview’s finding
- match and compare the findings with the TQM literature

The researcher adopted this strategy to help the reader understand and differentiate the literature’s finding from the empirical study finding. Furthermore, this strategy assisted the researcher in seeking to clarify the ideas in more depth.

a. Top management commitment

The researcher summarised the key findings regarding top management commitment (TMC).

- The participants consider the value of top management commitment as a critical factor in the ICT sector through visibility and explicitly, active responsibility and inclination of the resource and, time for quality management efforts.
- The vast majority of head managers and TQM managers in ICT companies are aware of the significant role that top management commitment could play in implementing TQM philosophy in ICT companies.

These results are based on the questionnaire findings that senior executives are explicitly committed to quality, with a score of 4.28 (Likert Scale 1-5), while they indicated that activating the responsibility for the evaluation and improvement to lead the quality drive scored 3.90. The lowest score recorded was in the inclination of top management to allocate adequate resources and time for quality management effort, with a score of 3.41. As the questionnaire findings show, all the statements in the TMQ section recorded more than 3, the middle of the five points on the Likert scale, which shows that applying the TQM factors is obviously considered appropriate in the ICT sector in Jordan.

The general managers and TQM managers in the ICT companies consider the value of top management commitment as a critical factor in the ICT sector via visibility and, explicitly, active responsibility and inclination of the resources and time for quality management efforts. Furthermore, they are aware of the important role that top

management commitment could play in implementing TQM philosophy in their companies. These results referred to the General and TQM managers' experience in working in the TQM field and their frequent attendance at national and international TQM conferences. The interviews support these results; twelve out of sixteen of the interviewees consider "top management commitment" to be the most important factor of TQM implementation. One General manager stated that

"We established a quality team which includes employees from higher administration and from all departments to provide valuable suggestions to improve all processes".

The findings mirror the TQM literature. Salaheldin (2003) emphasised that top management commitment to quality was the most important driving force that prompts TQM implementation in Egypt, ranking 4.88 (using the five-points Likert scale). Moreover, Baidoun (2004) in his research that was conducted in Palestine found that top management was committed to, and supportive of, quality management efforts.

Hradesky (1995), regarding the allocation of adequate resources and time for quality management effort, emphasises that integrating the major companies' activities under the TQM umbrella with appropriate devotion of both time and resources and the need for top management participation and performance should be adopted.

Moreover, the degree of visibility in implementing the TQM factor is considered as a critical element in the success of TQM implementation (Deming, 1982; Juran and Gryna 1980). Visionary leadership is core to the Deming management model and leadership is essential in order to create a service organisation that has both internal and external cooperation (Douglas and Fredendall, 2004).

c. Quality communications and structure (QCS)

Questionnaires and semi-structured interviews revealed key findings regarding quality communications and structure (QCS) in Jordanian ICT companies.

- There is a strong indication that the participants considered the element of quality structure as a significant for managing the organization's quality structure.
- There is a clear sign that there is a communication network across departments at all levels within the companies. Communication between managers and employees is considered a significant process and critical to implementing their business strategy and improving productivity.

The questionnaire findings show that the general managers, TQM managers and employees consider quality communications and structure as a required and major TQM factor leading to successful implementation of TQM in ICT companies. In this context, the questionnaire's results show that the quality communications and structure factor scored 3.90 overall. It has been found that the availability of quality management structure elements to manage the organisation's quality journey has scored the highest value, with 4.01, while the availability of the major elements of quality management structure used to facilitate the organisations' quality strategy objectives scored 3.85. In between, the formal cross-functional communication structure being widely implemented within the companies scored 3.86; whereas, the existence of a clear and consistent process for the communication of a mission statement and objectives defining quality values, expectations and focus scored 3.91.

Again, nothing can sabotage a quality movement faster than managers who are not engaged in it. Twelve out of sixteen companies participating in the interview process mentioned the importance of applying this factor within their companies; one general manager mentioned that

"We have a clear policy to deal with the employees by conducting regular meetings which give them a chance to express any issue or complain".

Another general manager stated that:

“Our company’s structure has a communication system that enables the channels of communication to be open. In addition, we visit the employees in their work place and listen to them from time to time. We encourage all heads of departments to transfer any problems or ideas to the management..... but the limited time prevents this process, particularly when our employees have many duties to achieve ”.

However, it is worth mentioning that four of the interview participants did not mention the value of quality communication and structure as a critical TQM factor implemented and adopted in their companies. This indicates that they are not aware of the significant role of this factor, which might relate to their organization’s culture.

The TQM literature introduces quality communications and structure as a critical element for aligning organisation components and sections into a cohesive whole (Ross, 1999). In this context, the TQM literature considers the value of the structure in managing the organization’s quality journey as a significant element of organisational structure to ensure the success of TQM implementation (Jabnoun, 2005; Shea and Howell, 1998; Waldman and Gopalakrishnan 1996). Moreover, much emphasis has been given to the value of the structure in facilitating the organisation to achieve quality strategy objectives. Burrill and Ledolter (1999) stated that

“To make a company’s belief and intentions effective, they must be backed by suitable process and an effective organisational structure. Included in the organisational structure should be an effective quality assurance group whose mission is to support management’s efforts to achieve quality”.

Sila and Ebrahimpour (2002) emphasised the role of communication in implementing a successful TQM strategy. Moreover, they summarized the value of communication in the organizations as the importance of effective communication across functions and

work units to ensure that customer requirements are addressed, that an environment of trust and knowledge sharing is created and that there is communication of TQM inside and outside the organisation.

c. Organisational culture (OC)

The results showed two key findings regarding organisational culture (OC).

- Organisational culture (OC) had the smallest mean compared with the rest of the other factors studied in this research.
- “Wasta” and nepotism are new dimensions which emerged from the interview findings and they are considered by the participants as major barriers to implement successful TQM in Jordanian ICT companies.

In the questionnaire there was a scoring of 3.74 for the creation of quality awareness among employees being ongoing in the company, while 3.73 was scored for the value of the trust between the manager and employees in the companies showing that the managers trust the employees to do their work without direct supervision. The lowest score was recorded for the idea of supporting the changes made by the General manager, with a mean value of 3.70.

New dimensions related to organisation culture have emerged from the interviews. These dimensions are Wasta and nepotism which are considered as exclusive phenomena in the Arabic culture in general and in Jordanian companies in particular. Wasta is a special type of illegal facility (English: a means, mechanism, medium) and sometimes it is even given the nickname Vitamin Waw (as it gives power and so). “Wasta”, for those who are unfamiliar with the term is about someone in a powerful position doing something (legal or illegal) for a favour to someone that could not be done without a “wasta” (Bayazidi, 2005). However, these dimensions are considered to have a negative impact on the implementation of TQM in the studied companies. This gives an indication that there are weaknesses of organisational culture in ICT companies

in Jordan. During the semi-structured interview process the managers emphasised that such cultural characteristics (“Wasta” and nepotism) do not fit the cultural environment that require the implementation and adaptation of TQM philosophy.

Organisational culture is described as an antecedent of TQM practice (Prajogo and McDermott, 2005). It is essential for successful TQM implementation and plays a significant effect on applying TQM (Rad, 2006). Tsang and Antony (2001) asserted that organisations must generate a culture where all the organisation’s members should participate in the quality awareness programme and quality improvement projects, especially those relevant to their workplace. This culture might modify an individual’s behaviour and attitudes in different ways.

The term national culture was introduced in 1980 by Hofstede, who defined the organization’s culture as *“the collective programming of mind, which distinguishes the members of one group or category of people from another”* (Hofstede, 1991, p5). Hofstede indicated that organisational cultures comes from national cultures; cultures manifest themselves, from external to deep, in leaders, values and symbols (Hofstede,1980). Furthermore, the differences in national cultures are reflected in how organisations are structured and managed (Chen, 2001; Hofstede, 1991).

The literature review reflects (in chapter 4) that Hofstede developed five dimensions in the national culture: power distance index (PDI); uncertainty avoidance index (UAI); individualism (IDV); masculinity (MAS); long-term orientation (LTO). The face-to-face semi-structured interviews reflected Hofstede’s five dimensions. The participants, who were the head managers and TQM managers emphasised the effect of the families’ relationships in the organisation’s culture that recorded high collectivism. This matches Hofstede’s finding in (1997) which characterized the Arab business culture by the high power distance, high uncertainly and collectivism and reflects the current situation in Jordan. Furthermore, many authors (such as Ali and Sabri 2001) stated that Arab management practices are a combination of four main characteristics: hierarchical

authority, rules and policy, delegation of personality and power of individuals. However, organisational culture did not record the highest means with five of the sixteen participants of the interview process mentioning that this factor is activated in their companies. While the others consider the need to change to the culture that fits the TQM implementation, however, they emphasised more the difficulties that they might face such as the organisation structure and the financial barriers.

d. Employees empowerment and training

The following list summarises the key findings regarding employee empowerment and training (EET) based on the questionnaire and interview results.

- Most Jordanian ICT companies provide training programmes, such as communication skills, effective meeting skills and leadership skills.
- There is a lack of understanding of the value of empowering employees' to make suggestions and engaging them in decision making in ICT companies in Jordan.

The questionnaire's findings revealed that employee empowerment and training recorded an overall mean of 3.80. The existence of system linked rewards to employees' quality achievement scored the highest mean 3.80 among other statements. Providing the employees with training courses in order to improve their communication, leadership and effective meeting skills recorded the score 3.89. Providing all employees in companies with quality related training and the system for recognition and appreciation of quality efforts and success of individuals and teams had the same value of mean 3.83. The empowerment strategy that the companies adopt to encourage employees to accept TQM implementation responsibility scored with a mean of 3.80. The implementation of the employees' suggestion in the companies had the lowest score of all the statements. It scored with a mean of 3.55.

The semi-structured interview findings support those of the questionnaires. Seven out of sixteen participating managers stated that they run training programmes which aim to improve and provide their employees with up-to-date skills. They added that the employee empowerment programmes have a special focus in their companies.

Five out of the seven managers interviewed mentioned that their companies allocated a certain amount of money in their annual budget to spend on employees' training programmes conducted either inside or outside the country.

Face-to-face semi-structured interviews added a new dimension; one General manager said that:

"We believe in the importance of training programme to benefit our employees because we believe that they have positive results that reflect on the company's product ability; during our preparation of the company's budget, we point out from the beginning the expected spending on training programmes that are allocated as investment expenditure and not within current expenditure. This is contrary to what usually happens in other companies".

On the other hand, the rest of the interviewees (9 out of 16) have two different perspectives. 5 out of those 9 interviewees emphasise the value of training to improve the employee's skills and neglect the role of empowerment because they believe that their companies they are not at the stage of adopting an employees empowerment policy because their business is quite new, while only 4 of them mentioned the benefit of the training programmes without mentioning anything regarding empowerment as a significant TQM factor and its role in applying and implementing TQM.

In the TQM literature, Tsang and Antony (2001) explained the importance of employee empowerment programmes; they added that trust is considered as a common element. Employees should be encouraged to control, manage and improve the processes that are within their responsibility. In addition, they emphasised the importance of implementing employees' suggestions and introducing them into the companies' strategies. Moreover, Osuagwu (2002) confirms that the company must produce a decision-making authority

that encourages the employees to create new ideas for improving quality and apply these notions at all levels.

Dale (2003) identified the value of training employees at all levels in organisations and stressed that the companies should support their employees with the right level and standard of education and training to ensure that they had a general awareness and understanding of quality management concepts. He added that “*without training it is difficult to solve problems and, without education, behaviour and attitude change will not take place*”. Again Tsang and Antony (2001) indicated that employees must be recognised for their contribution and should feel that they are part of the organisation. Commitment, recognition and appreciation are necessary for employees to motivate themselves for more achievements.

e. Quality measurement and benchmarking (QMB)

The key findings of quality measurement and benchmarking (QMB) could be summarised as:

- QMB in ICT companies in Jordan is considered an important element for applying and implementing a TQM strategy
- the majority of General and TQM managers are aware of the value and the significant roles of QMB in applying and implementing a successful TQM strategy and philosophy within their companies
- 31.25 % of the interview participants considered that quality of customer feedback is the most important measurement tool adopted in their companies.

The questionnaires measured five main statements related to QMB adoption in ICT companies in Jordan. The use of SPC to control variability and improve processes in the companies recorded the highest score which was 4.51, while the lowest rank was recorded on the use of self-assessment tools and other mechanisms to track and improve performance gaps in the implementation and effectiveness of system, process and

practices, with a score of 3.01. In between competitive benchmarking made against primary competitors had a score of 3.86. Informal benchmarking and other formal forms of information acquisition and sharing with organisations in different sectors are in place to identify best practices for improvements and opportunities scored with 3.75 and the cost of quality process to track rework, waste, rejects and for continuous improvement is prioritised with 3.66.

The semi-structured interviews revealed that eight out of the sixteen participants (50%) mentioned that quality measurement and benchmarking are considered as critical TQM factors in their companies and marked it as an original element for applying and implementing a successful TQM strategy. On the other hand, the other 50% of the participants (eight interviewees) had two different views. Five participants mentioned that within their companies customers' feedback is employed as a fundamental tool in applying and implementing quality measurement and benchmarking. In this context one TQM manager mentioned that

“We use benchmarking to demonstrate the accurate company's situation compared with other companies in the same field inside and out side Jordan”

Another manager added that

“We measure our company's performance by conducting surveys that are distributed to the customers to obtain feedback that gives us a clear idea about our company's performance”.

However, three of the interview participants did not mention that their companies applied QMB.

These results match the TQM literature which introduces SPC as a fundamental aspect utilized to decrease process variability, calculating the cost of quality building on the cost of quality process to track rework, waste, rejects and for continuous improvement (Evans, 2005).

Moreover, Freytag and Hollensen (2001) added that the purpose of benchmarking is to identify best practices that can be adopted and implemented by the organisation with the purpose of improving company performance. Kumar and Chandra (2001) reported that, in the late 1990s, 500 organisations were using benchmarking on a regular basis. Furthermore, quality measurement and benchmarking are considered as a way of measuring an organisation's strategies and performance against best-in-class organisations, both inside and outside its own industry (Chen, 2002).

Roden and Dale (2000) stated that quality costing can be considered as a measurement of a company's performance with respect to the process by which a product is produced or a service is delivered. Moreover, Ford et al (2004) pointed out that "*self-assessment is increasingly prevalent in many organisations*".

f. Continuous improvement (CI)

The key findings regarding continuous improvement (CI) are now summarised.

- The findings show that there is a lack of applying IC within ICT companies in Jordan.
- The majority of the participants are not aware of the value of applying and implementing CI within Jordanian ICT companies.

The questionnaire results revealed that the adoption of CI in Jordanian ICT companies scored with an overall score of 3.74. The level of applying CI as a TQM factor within Jordanian ICT companies is measured in this study through five main statements. The first statement aimed to measure the team approach and ranked the highest mean with 3.84; the second one measured the adaptation of CI on all levels and operations. This element had the lowest score of 3.66. The last three statements measured the delivering of the latest technology to the companies, the contributing to the application of TQM and the value of updating and consideration to the value of the competitiveness on

building the basis of high quality services. These elements scored at means between 3.70 and 3.75.

The face-to-face semi-structured interviews reported that 37.5 % of the participants mentioned that their companies are interested in CI and consider it as a critical factor leading to the successful implementation of TQM. They are aware of the value of applying CI and the critical and major role that CI plays in achieving a successful business especially in ICT companies, while 62.5% of the interview participants were divided into two groups. The first one, consisting of half of the previous percentage, has a misunderstanding of the CI process. They focused only on the ongoing improvement of the final level of outcomes. The second group did not refer to this factor during the interviews. This gives an indication that the majority of ICT companies in Jordan are not aware of the importance of applying this factor in order to have successful and effective application of TQM.

The continuous improvement concept is a critical success factor for any organisation and should be applied as the lifeblood; every successful TQM initiative should be built on continuous improvement (Walsh et al, 2002).

In the TQM literature many scholars mentioned the benefits of applying CI in organisations. Temtime and Solomon (2002) asserted that CI is not about solving isolated problems as they occur but quality improvement must be undertaken in a systematic, continuous and step-by-step method. It deals with making decisions dependent on data, looking for original causes of problems and looking for permanent solutions instead of relying on rapid fixes. Al-Qudah (2006) stated that CI is significantly applied and implemented in the companies that adopt a TQM philosophy. Evans (2005) indicated that there are several types of improvements: enhancing the products and the services value; improving productivity and operational performance; improving flexibility, responsiveness, and cycle time performance; improving organisational management processes

g. Customer focus/ satisfaction (CFS)

The key findings for customer focus/ satisfaction (CFS) are now given.

- The findings show that CFI as a major TQM factor is applied and adopted in ICT companies in Jordan with high consideration given to its value for achieving successful TQM philosophy and programmes.
- The general and TQM managers of ICT companies in Jordan are aware of the value and significant role that CFS play in their companies' improvement and success.

The questionnaire results show that Jordanian ICT companies pay noticeable attention and consideration to customer satisfaction and requirements, with 3.81 as an overall mean. This factor was measured through three main statements. The first one, comprehensive identification of customer's requirements and needs, scored 3.91. The second one, seeking the customers' feedback, via survey and another measurements tools, had the highest score of 4.16. The third one, systematic review and analysis of key process measures that have a direct or indirect impact on value-addition to customer satisfaction are implemented, had the lowest score of 3.40.

Throughout the interview process 15 out of the 16 participants mentioned that the customer satisfaction factor is adopted and implemented in their companies and has a high priority within their companies. They considered it as a corner stone for the success of their TQM programme and their companies' business. However, one interviewee did not refer to this factor and its importance during the interview process.

Throughout the interviews the managers mentioned that customer satisfaction is given high priority on their agenda because they believe that it is the reason behind the success

or failure of the company. One TQM manager maintained that, in his company, there is a system for monitoring customer complaints, their suggestions, recommendations and opinions about their services and products. Similar surveys were used with customers as the major method for collecting mass customer information. He stated that:

“The customer’s voice is the signature that assists our company in seeking to develop its products, services and evaluation services. In our company we have a particular department that is responsible for measuring customer satisfaction via the survey and recording the customer’s suggestions and recommendation in order to develop and justify our products and services”.

Moreover, ten managers mentioned that their companies have established a modern department that is responsible for measuring the customers’ satisfactions and services. This department is directly responsible for contacting the customers to clarify their opinion about the company services, to listen to the customer complaints and suggestions for how the company can improve its services and products. In addition, their companies set up free phone number services to ensure that the customers receive full services. One TQM manager mentioned that:

“Customer satisfaction is considered as one of our fundamental interests... we pay special attention to the customer’s needs and requirements. We have established a special customer services department and free phone numbers that provide them with freedom to contact us when they have any problems or any suggestions to improve our services”.

Other TQM and general managers mentioned that, although their companies had not established a particular department to service the customer needs, all the departments in the companies are responsible for providing the customers with the service that they ask for. One of the managers mentioned that:

“Although we don’t have a customer service department, all our company’s departments are responsible for responding to our customer needs and enquires.”

The literature that is written in the TQM area considers CFS as the ultimate reason for TQM philosophy implementation (Deming, 1986). Therefore, a satisfied customer is a

critical factor for a successful internet company (Alomaim et al., 2003). Chapman and Al-Khawaldeh (2002) emphasised the need for adopting a customer satisfaction element in the companies that applied TQM philosophy and they considered it as key element for fixing and resolving customers' problems and complaints. Moreover, Zhang et al. (2000) pointed out that customers' complaints should be treated as high priority to improve the customers' satisfactions. Moreover, they emphasised the role of customer satisfaction surveys as measurement tools to increase the customer satisfaction in the organisations.

Evans and Lindsay (1999) indicated that ever-improving the value of products and services is directly connected to the satisfaction of customers. Retaining customers was viewed as being dependent on achieving higher levels of satisfaction than those of the organisation's competitors.

h. Quality information systems (QIS)

Three key findings have emerged from the study.

- QIS is considered as a critical TQM factor in Jordanian ICT companies and a significant factor for a successful TQM programme.
- ICT companies in Jordan have noticeable interest in adopting QIS that leads to facilitating the TQM processes, improving their performance and helping to create qualified data and information.
- Using the quality information system increases the quality level of the service and, in turn, fulfils and satisfies customer requirements.

The questionnaire results show that QIS scored at an overall mean of 3.88. This factor is measured by three main statements. Firstly, the use of IS provides high-quality data and information to employees in order to achieve high quality customer services within ICT companies in Jordan ranked the highest percentage with 4.19. Secondly, the creation of a website aims to measure the customer's satisfactions scored 3.81. Thirdly; the adoption

of advanced technological information system supports advanced implementation for the quality management system scored 3.65.

It has been found from the interviews findings that 68.75% of the interviewees mentioned that an information system must be considered as a critical TQM factor; it plays a major role in applying and adopting successful TQM programmes and philosophy. It leads to an increase in the level of quality services which, in turn, fulfils the customer needs and demands and achieves customer satisfaction. One TQM manager stated that:

“The quality information system at our company is considered as the main and supportive factor to the other TQM factors at the company. Therefore, we are very keen to adopt it. We totally believe that adopting new technologies is going to assist our missions to continue our company improvement process. We are very keen to update our company’s website regularly because we believe that if our customer could not find what he/she is looking for then he/she will move to another website to shop in”.

Duran-Arenas et al. (1998) in their study “The development of a quality information systems: a case study of Mexico” found that one of the primary obstacles in the implementation of continuous quality improvement programmes in developing countries is the lack of timely and appropriate information for decision making. This result is not consistent with the result of the current study which was conducted in Jordan as a developing country. Which result could be reasonable because all the ICT companies base their work on information and communication technology and deal with various information systems. More than half of these companies (17) are data communications companies (Internet companies) and the rest are cellular, pre-paid card, radio trucking, paging and satellite companies. The nature of the work of these companies as service companies require highly- qualified information systems.

Forza (1995) in his study titled “*Quality information systems and quality management*” found that quality information systems consider information technology, support managers and employees in their activities in order to improve quality performance.

In the TQM literature many researchers and observers state that information systems technology in the organisations must be considered as the key enabler of TQM implementation and they added that information technology could be an enabler in the drive for TQM success and continuous improvement, even when the basic processes and management worker relationships remain traditional. Moreover, it could be a key role in the TQM initiative through the strategic, human resource and technology areas (Zadrozny and Ferrazzi, 1992, Konstadt, 1990).

In the same context, Mjema et al. (2005) indicated that the use of information technology in quality management can improve quality through the following methods: online information about the quality level; enhancing quality awareness; reduction quality costs; speedy processing of quality data. Furthermore Duran-Arenas et al (1998, p. 455) stated that:

“Quality information system in Mexico is an evolving process in an ongoing effort to use data for effective and efficient decision-making in the planning, monitoring and evaluation of the services delivered by the national health care system”.

i. Policy and strategy planning (PSP)

This study revealed key findings regarding policy and strategy planning (PSP).

- ICT companies in Jordan considered PSP as a critical factor; moreover, it is applied and implemented effectively in the participating companies.
- The managers are fully aware of the need for effective adoption of PSP for successful TQM implementation.
- The rapid changes in the market place environment threaten and have negative effects on strategic planning.

The questionnaire findings revealed that policy and strategy planning as a fundamental factor to implement successful TQM strategy scored with an overall mean of 4.00. The result indicates that this factor is strongly implemented and adopted in Jordanian ICT companies. This factor was measured by three main statements. The first statement measured the general policy development and effective employment of goals in Jordanian ICT companies. This element had the highest mean (4.22) of all the elements. The second statement measured the reviewing of the formulation and implementation of strategy and strategic planning in ICT companies in Jordan and scored with a mean of 3.98. The last statement measured the implementation of strategic quality planning on the long term quality journey. This element had a mean of 3.83.

The interview findings showed that ICT companies' principals were aware of the value of applying and implementing policy and strategy planning. 13 out of 16 of the interview participants mentioned that this factor applied in their companies. Only three of the interviewees did not stress the important role that PSP could play in implementing TQM philosophy within their companies. They considered that the rapid change in the market place, such as the unstable political environment in the Middle East, in general, threatened the strategy planning process because the future becomes unpredictable and many changes happen in a short time.

Policy and strategic planning are considered as an essential part of management's commitment to improve the organization's quality (Juran, 1974). Moreover, quality policy is considered as a standard for practice that sets priorities by influencing the entire organisation on what to do and what not to do (Crosby, 1979).

The studies in TQM introduce PSP as critical TQM factors. Baidoun (2004) indicated that the development of a quality policy must reflect the organisation's mission including corporate values, expectations and focus. Zairi and Youssef (1995) stated that senior managers should play an important role in developing a comprehensive policy. This policy must be based on a clear vision and mission that includes quality goals

deployed effectively at all levels of the organisation and policies adopted as part of the management commitment.

The TQM literature asserts that the lack of strategic business planning in companies is considered as a fundamental drawback in TQM implementation and business process initiatives (O'Regan and Ghobadian, 2002). However, effective strategic planning that includes active participation by top management and lower-level employees, supplier involvement and strong customer focus to identify their requirements and needs are considered as the original factor for a long term quality journey (Evans and Lindsay, 2001). In the Jordanian context PSA is defined as a fundamental factor for measuring companies' QM because strategic planning is the most important principle of The King Abdullah 11 Award for Excellence. In other words, companies which are seeking to win this award must apply PSA to win the award (Abu-Hamatteh et al, 2003 and Rawabdeh, 2008).

j. Supplier's relationships (SRs)

Building on the study findings regarding the supplier's relationships (SRs) it could be concluded that:

- ICT companies in Jordan consider SRs as an important factor in TQM implementation and a major element leading to a successful TQM programme
- Jordanian ICT companies are aware of the value of developing relationships with suppliers.

The questionnaire measured this factor through three statements. The findings show that Jordanian ICT companies are aware of developing relationships with suppliers that lead to continuous improvements in quality. This item scored 4.06.

Moreover, the findings show that Jordanian ICT companies depend on relatively few dependable suppliers who are evaluated and selected based on their capability and commitment to product and service quality and value for money. This item scored with a mean of 3.99. Regarding the third statement the result revealed that Jordanian ICT companies conduct periodic examinations of the materials supplied to ensure conformity with the standard specifications. This element scored 3.85.

The interview findings revealed that 11 out of the 16 participants reported that this factor is implemented and applied in their companies. 5 out of the 11 managers talked about the standardisations for choosing the suppliers. They mentioned that they depend on the suppliers' reputation and experience. One of these managers said that:

“Our company is aware of the role of the suppliers in continuous improvement. So we depend on the dependable suppliers who have the ability to supply our company with qualified products and services. From this perspective, our company put standardisations such as experience and, good reputation in order to select the best suppliers and to have and create a long-term relationship with the suppliers”.

Five out of the 16 interviewees agreed with this factor but they did not focus on its importance. However, one of them did not mention this factor at all.

This result matches Al-Qudah's (2006) study in Jordan in the pharmaceutical industry sector. He found that the supplier's relationship as a critical TQM factor is given priority in the companies that adopt and implement a TQM philosophy. It is worth mentioning that Al-Qudah used the same scale in his study that was used in the current study and this factor scored 4.02. Moreover, Forza and Filippini (1998) and Zhang et al. (2000) stated that the suppliers play a well-recognised key role in quality management and they have a clear influence on several quality dimensions. Baidoun (2004), in his study in Palestine, said that internal customer-supplier relationships must be created to develop the customer's satisfaction and to meet the customer's requirements.

Moreover, these results are consistent with the literature. Crosby (1989) emphasised the relationship between supplier and buyer as one of the most important parts of the quality improvement process.

Regarding the suppliers' evaluation, Thakur (2002) asserted that suppliers need to be evaluated and selected on their ability to supply the product or service in accordance with the organisation's requirements. Moreover, Deming (1986) focused on the importance of selecting suppliers on quality rather than on price alone and working directly with the selected suppliers to achieve the highest possible quality supplies.

Furthermore, the results showed that Jordanian ICT companies employed a periodic examination of the material supplied to check its agreement with the standard specification. This also goes for Richardson (1997) who mentioned that Arvin North American Automotive in Columbus, Indiana, uses a supplier's quality management (SQM) system of controls for incoming goods and services. The company believes that the supplier must meet specific goals:

“Continuous improvement in quality and productivity, waste elimination, process control, manufacturing flexibility, standardisation, and defect prevention”
(Richardson, 1997).

k. Social responsibility (SR)

Within the current study social responsibility is not measured as a TQM factor in the questionnaire. However, some general and TQM managers who participated in the interviews mentioned the role of social responsibility in applying a successful TQM programme.

Three of the interview's participants mentioned that SR is considered as a new phenomenon in Jordanian ICT companies and must be considered a critical factor for implementing a successful TQM philosophy. The participants define SR as terminology

used to define the role of the companies in improving their communities' social life by delivering a wide range of social services that encompass many activities which help to reduce the unemployment, increase the health care services, reduce the poverty, reward the intellectual capital and limit the illiteracy. One of them said that

“A new term in our organisation is social responsibility which has emerged over the last few years. This term reflects the creation of new social activity such as rewarding the top three students in the high school in the Kingdom. Furthermore, we provide the local community by the employees to help in the social services and so on”.

Three participants agreed with this definition; however, two of them added that the managers must take into consideration the ethical issues that relate to the employee's social life. In other words, they emphasised the role of the principles used in developing the company's internal communities by providing special social services, such as improving employees' health care, supplying life insurance and considering employees' social life (religion's celebrations).

In the TQM literature SR is considered an important factor that measures the business organisation corporation with the external environment to improve the citizenship and to recreate relationship (Perry, 1997). Moreover, Solis et al (2000) emphasised the need for SR in developing a quality process and recognized corporate quality citizenship as an important element of the effective implementation and usage of quality management practice. He added that:

“Practising quality citizenship refers to the leadership and support of publicly important purposes. Such purposes might include importance of education, improvement of safety and health in the community, environmental excellence, resources conservation, and community services. Quality citizenship practices may still be scarce in some companies but initiatives such as responsible care and sustainable care are gaining wide-ranging support...companies that do not prepare for a time when public responsibilities are of importance will also out do ones which do” (Solis et al, 2000, p603).

Peters (1997) argued that social responsibility is good capitalism and responsible. Therefore, business ethics is an important element in social responsibility and, in turn, a determinant of good capitalism (Svensson and Wood, 2005). Moreover, Bowman and Wittmer (2000) agreed that organisations survive by improving the quality of people's lives by producing goods and services; business ethics in TQM is affected by contextual issues.

The TQM literature and a few semi-structured interviews emphasised the role of SR in improving the citizenship and social life of the community. However, this factor was not given much consideration in the Arabic world in general, and in Jordan in particular. One participant said that

“The Arab world until now lacks procedures and laws that activate this factor to serve the surround boundary”.

Although the literature gives high consideration to the value of SR in implementing TQM philosophy this result did not match the empirical study findings. The researcher reflects that this is for several reasons. First, most ICT companies in Jordan are newly created and do not have a deep understanding of the culture issue that is related to this factor. Second, there is a lack of governmental policy and law that supports this factor. Finally, the lack of consideration to the value of this factor in local communities and social culture effects negatively on the companies' adoption of this factor.

7.3.2 Second objective: To explore the impact of TQM implementation on improving companies competitiveness through profitability, service quality, effectiveness and market share

Exploring the impact of TQM implementation as an independent variable to improve companies' competitiveness is the second objective of the current study. In this part the researcher tested four hypotheses:

- the impact of TQM implementation on improving the companies' profitability
- the impact of TQM implementation on improving the companies' service quality
- the impact of TQM implementation on improving the companies' effectiveness
- the impact of TQM implementation on improving the companies' increase of the market share.

To collect the required data, the researcher used questionnaires followed by multiple regression analysis plus Pearsonian's correlation as his main tools and semi-structured interviews to obtain more in- depth information.

It is evident that there is a lack of investigations that study the impact of individual TQM elements on TQM outcomes (Ahire and O'Shaughnessy, 1998). Sila and Ebrahimpour (2005) added that TQM factors must be created within the organisation in order to achieve favourable business results (Sila and Ebrahimpour, 2005). Therefore, the researcher found that introducing this objective within the current study may contribute to the TQM literature especially that related to TQM implementation in the Arab world. The four hypotheses have been presented separately with their findings and discussion.

a. First hypothesis

The impact of TQM implementation on improving the companies' profitability

The questionnaire results indicate that TQM factors, including top management commitment, quality communication and structure, quality measurement and benchmarking, customer satisfaction, policy and strategic planning, quality information systems, organisational culture and supplier's relationship, as significant TQM factors have a positive effective impact on the profitability achievement in ICT companies in Jordan.

The interviewees reported that 81.25% of the participants confirmed that profitability must be the expected result of implementing the TQM philosophy and programme in their companies. Moreover, the revenue of their companies has been increasing more and more which synchronizes with the increase of customer numbers and their satisfaction level with the companies' services and products. On the other hand, 19.75 % of the participants believed in the critical role that TQM implementation plays in achieving profitability. However, they mentioned that profitability is not the major and fundamental purpose of their companies; the aim of applying TQM within their companies is to achieve competitiveness, service quality and a good reputation which, in turn, achieves profitability in an automatic way.

The current on investigation findings match what has been introduced in the TQM literature. Ghobadian et al. (1994) stated that high quality of service is required to improve profitability. Al-Qudah (2006) added that adopting and implementing TQM in Jordan has had a positive affect increasing the companies' profitability. It is evident that the strategic benefits of quality programmes and better quality are proven to contribute to a greater return on investment (Cole, 1992; Philips et al., 1983).

There are many Jordanian and international examples to prove the impact of TQM implementation on achieving and increasing profitability. Revenue for both telecommunications and IT have steadily increased over the past five years. In the year 2003 Jordan witnessed an increase of 30% in the total revenue of the ICT sector. Investment grew around 17% and employment grew by 100% during 2004 (Abu-Ghazaleh and Co. Consulting, Report, 2005). Gustafsson et al., (2003) asserted that improvements in internal quality may improve productivity, thereby increasing profitability indirectly. They added that customizing a product to exceed the requirements of the customer can raise customer fulfilment which, in turn, has a direct result on customer loyalty and retention and, thereby, increases future sales to achieve and sustain competitive advantage.

Furthermore, the Jordanian ICT sector contributes up to 5.6% in the gross domestic product (GDP) as a result of the profitability growth. Moreover, the employment of ICT professionals has increased from 1,250 in 1999 to 10,000 in 2002, to 20,000 in 2003 and reached 30,000 by the end of 2004. *“Total investments in the Jordanian IT sector (at the end of December 2003) stood at almost \$80 million, an investment figure which has come about as a result of the efforts of int@j and the REACH initiative”* (Abu-Ghazaleh and Co. Consulting, Report 2005, p10).

However, there is a study conducted in the USA by Sila and Ebrahimpour (2005) which revealed a result regarding the impact of customer satisfaction as a vital and significant TQM factor on companies' profitability which do not agree with the current study's results. They found in their study that customer focus did not have any direct or indirect effect on profitability as a business result. Wright and Snell (2002) argued that simply having a customer focus and acquiring customers may not be sufficient for success since customers can easily be lost if they have a bad experience with the products and services, or if new entrants to the market attract them. However, ICT companies depend on customer satisfaction to achieve high profitability because the customers have little experience with ICT companies as these companies are new in Jordan. This short length of experience, plus a limited market, make the customers satisfied with the services and products that are provided by their companies. Unlike the USA, customers in Jordan cannot be lost easily because they do not have long experience and the broad market that customers in the USA have.

b. Second hypothesis

The impact of TQM implementation on improving the companies' service quality

The questionnaire findings show that TQM factors including top management commitment, quality communication and structure, quality measurement and benchmarking, customer satisfaction, policy and strategic planning, quality information

systems, organisational culture and supplier's relationship have a positive effective impact on the improvement of service quality in ICT companies in Jordan.

General and TQM manager's interview results showed that 75% of the interviewees mentioned that a TQM programme and philosophy is implemented and adopted in their companies in order to build a high level of quality services. Top management commitment and customer satisfaction are considered by the interviewees as the main TQM factors which play the major and significant role in improving service quality. Only 25% of the interview participants focused on the impact of TQM implementation and adoption within their company and on the improvement and increase of competitiveness and profitability more than quality of service.

Forty five regular ICT customers have been interviewed in order to get a clear picture about the level of service quality from the service recipients' perspective and to evaluate the extent to which they are satisfied with the level of service quality that they receive from ICT companies. The vast majority (90%) of them expressed their satisfaction with the level of quality of ICT companies' service. They reported that Jordanian ICT companies provide them with quality internet and mobile services. Moreover, their companies cover all locations in all cities with clear communications; they can request customer services to solve any problems, any time, with immediate answers. The companies provide them not only with quality services but also with various and varied ones. On the other hand, the rest of the customers (10%) indicated that they face some problems with their companies, including the pressure on their existing network companies, especially at peak times.

Many studies in TQM literature match the current study results, such as Escrig-Tena (2004) who demonstrated that TQM implementation achieves improved quality. In addition, Jannadi and Al-Saggaf (2000) found in their study that improving service quality is achieved through understanding the customer's anticipation forming process. Service quality can be improved for all customers.

Moreover, the TQM literature clearly shows the fundamental roles of TQM factors in creating a reasonable affect on quality services (Al-Qudah, 2006). Many other authors have published reports that support the same idea, such as Abu-Ghazaleh and Co. Consulting, Report (2005), Global Information Technology Report (2004-2005) by World Economic Forum, World Bank Indictors (2005), Telecommunications Regulatory Commission (2007) and Ministry of Information and Communications Technology Report (2006). All these reports emphasise that the ICT sector in Jordan recorded a high level of service quality. These reports reflected that the government encourages ICT companies in developing their services. Moreover, companies' distribution plays a fundamental part in improving the companies' services quality. Some examples are now given.

- Jordan Telecom has built a digital network which allows 100% of the population to have internet accessibility with good quality and serves up to 477,584 users (Abu-Ghazaleh and Co. Consulting, Report, 2005).
- Internet connections, cell phones coverage and ICT services provide high quality services with little to no downtime (Abu-Ghazaleh and Co. Consulting, Report 2005).
- Jordan has achieved remarkable success in regulatory and legal improvement that have measurably improved Jordan's E-readiness (Abu-Ghazaleh and Co. Consulting, Report, 2005).

The findings of the current study's questionnaire and interviews with General and TQM managers and customers and the literature that is written in the TQM area indicate that TQM implementation achieves quality of service.

On the other hand, Li (1997) stated that there is no correlation between top management leadership and service quality performance. Moreover, Wilson and Collier (2000) had the same idea and added that there is also no correlation between leadership, human

resource management and strategic planning with customer satisfaction through quality service. Furthermore, Curkovic et al (2000) concluded that there is no correlation between suppliers' development with product reliability and customer service.

However, findings of the current investigation show a clear impact of adopting and implementing a TQM philosophy and programme on service quality which is not consistent with the previous studies. The reasons behind this paradox are explained as being because the ICT sector and its services is new in Jordan, making the customer evaluate the level of the service quality satisfaction with the level of quality service, unlike the customer in developed countries where the previous studies were conducted. Different culture, backgrounds and circumstances could give the customers different perspectives and view points in evaluating the level of services.

c. Third hypothesis

The impact of TQM implementation in improving the companies' effectiveness

The questionnaire findings show that applying TQM factors, including top management commitment, quality communication and structure, quality measurement and benchmarking, customer satisfaction, policy and strategic planning, quality information systems, organisational culture and supplier's relationship in Jordanian ICT companies, was a positive impact on the companies' effectiveness.

The interview results show that 62% of the participants mentioned that the implementation of TQM factors impacts positively on the companies' effectiveness, while the rest (38%) considered that, by reaching the companies' aims, competitiveness can be achieved. In other words, achieving effectiveness would be the natural result of achieving the companies' goals.

Regarding the general and TQM managers' points of view about how they define the concept of effectiveness in their companies, there were three main views: first, that effectiveness is productivity "getting the most output from the least input"; second,

effectiveness is “doing the best thing”; third, effectiveness is “drawing out specific goals taking into account the quality of the output”. However, effectiveness was defined by Siegel and Shim (2005) as “*the extent to which actual performance compares with targeted performance*”, and was defined in The Oxford Dictionary of Sports Science and Medicine as “*the degree to which a purpose is achieved*” (Kent, 2006). Accordingly, there is a common understanding of the concept of effectiveness among the participants along with the known concept in the literature.

The TQM literature introduces TQM as the best way to manage the organisation’s effectiveness to compete globally (Kunst and Lemmink, 2000; Hendricks and Singhah, 1997; Easton, 1993). The empirical studies that have been undertaken in this field showed significant evidence that TQM could be the unique strategy that improves the effectiveness, efficiency, flexibility and competitiveness of a business as a whole (Ho and Fung, 1994).

In 1995 Jordan was the first Arabic country to enact a modern telecom law. Moreover, the governmental principles established an independent telecommunications regulatory body called the Telecommunications Regulatory Commission (TRC). The role of this body is to promote fairness, transparency, competition and investment. Moreover, the Jordanian legal and regulatory framework for telecommunications and mobile services is continuously updated to meet the dynamic technological changes such as convergence, 3G and all types of wireless communications.

During the last decade, Jordan witnessed significant efforts to harness ICT in order to develop the effectiveness and build a strong ICT sector (Global Information Technology Report 2004-2005). Moreover, Jordan has the possibility of generating a competitive advantage to play an important role in the technological industries and is engaged in a number of initiatives in order to pave the way for the country to become a regional IT centre (Nusseir, 2001).

The Jordanian ICT sector scores 9 out of 104 in other countries in terms of government success in ICT promotion in the world ICT competitiveness report, and score first in the Arab world in ICT development, which indicates that competing at a global level means high quality standards within the sector itself and the country (Global Information Technology Report 2004-2005).

It could be concluded from the previous international reports and papers that Jordan's success of building a strong ICT sector was through achieving competitiveness.

d. Fourth hypothesis

The impact of TQM implementation on improving market share

The questionnaire findings revealed that implementing and applying TQM strategies and programmes play a vital role in increasing and improving Jordanian ICT companies' market share.

The interview findings show that 50% of the participants mentioned that market share is growing as a result of the adoption and implementation of TQM strategy within ICT companies. They added that market share could be increased by enlarging the market size and increasing the number of customers, by being competitive in new markets and the position and success of a company in the market. A TQM manager confirmed that

“We can't increase and enlarge our market share without applying quality management”.

However, 50% of the interview participants believed that TQM implementation has a vital role in enlarging market share but they do not agree that market share has an important effect on increasing the company profitability. A general manager stated that

“In the meanwhile, we focus more on stability in the market than on creating a new market, as creating a new market usually does not increase the company profitability specially with highly competitiveness in the ICT sector market”.

The same finding was concluded by O'Regan (2002) when he said that the impact of market share is not always reflected in a company's profitability or performance.

The TQM literature introduces the idea that the improvements in quality and productivity allow organisations to raise their market share and to charge higher prices for their products, which, in turn, results in superior profitability (Garvin, 1984). O'Regan (2002) opined that the literature considers market share to be one of the most important indicators of organisational success. Indeed, market share is often used to describe the position of the firm within its industrial sector. Many studies demonstrate that TQM achieves a growth in market share, such as Brah et al (2002), who stated that TQM philosophy emphasizes that effectively managing primary TQM factors improves market share.

Moreover, Tsang and Antony (2001) indicated that organisations today have not only raised their market share by improving the quality of products and /or services but also by improving their employees' performance. Evans (2005) added that customer satisfaction translates directly into increased profits while satisfaction is significant in that the modern companies have to look further to achieve strong profitability and market share requires loyal customers.

Jordan is now the ideal gateway to the Middle East and North Africa (MENA) countries as an area that has more than 350 million customers with a purchasing power that exceeds US\$500 billion in the ICT market (Ministry of Information and Communications Technology, Report, 2006).

The market of the Jordanian ICT sector recently witnessed growth regionally and internationally. Jordan has become a local IT leader and globally recognized exporter of IT products and services, exploiting its core human capital advantage (REACH, 2001). Jordan has a potential market in the Arab world. Several Arab countries have already begun doing business in Jordan; for example, Qatar's e-government project that was developed by a Jordanian IT company. Another example is that Bahrain Telecom

(Batelco) has formed Batelco Jordan, which is fully managed by Jordanian IT companies (Al-Jaghoub and Westrup, 2003).

Saudi Arabia and the Gulf countries are the main export markets for Jordan, as many reports indicated. Moreover, Jordan has a number of US company representatives including Microsoft, IBM, Oracle, Dell, Compaq, HP, US Robotics and Apple (Ministry of Information and Communications Technology, Report, 2006).

On the other hand, some studies of the role of TQM implementation in increasing market share found different results and did not match the result of the current study. For example, Wilson and Collier (2000) found that there is no correlation between TQM factors of leadership, human resource management and strategic planning with market share. Moreover, Curkovic et al. (2000) added that there is no correlation between committed leadership and market share growth. The reason behind this paradox is the limitation of the market place in Jordan compared with the countries in which the other researchers conducted their research. A limited market enables the companies to penetrate the market easily. The increased demand of people to participate in the Internet and mobile phone services contributes to increasing the companies' market share as a result of attracting these services. The reports indicate that the Internet and mobile companies in Jordan have the highest rate of all other companies for spending on advertisements and measuring the customer feedback about the companies' products and services (Alghad, 2007).

Based on the previous discussion it could be concluded that the Jordanian ICT sector market share is increasing and growing among the new markets in Jordan and the Middle East. The investigation results and findings asserted that this growth in the market share came as a result of TQM implementation and applying critical and vital factors of TQM such as top management commitment, customer satisfaction, policy and strategic planning.

To sum up the key findings it could be said that ICT companies in Jordan notice a significant impact on the effectiveness, profitability, quality services and market share after their implementation of the TQM factor in their companies; many international reports have supported these findings as the previous discussion presents. Moreover, the interview findings revealed that creating a good reputation is another benefit which could be achieved by applying a TQM philosophy.

7.3.2.1 Company's business type and competitiveness achieving

The results revealed that the companies which invest in the area of Internet business by applying TQM were able to achieve high a level of competitiveness compared with the other companies which invest in the area of mobile and landline phones among others. The results clearly indicated that the correlation between the TQM factors of quality communication and structure, continuous improvement, policy and strategic planning, quality information systems and suppliers relationships and competitiveness were stronger in the case of Internet companies. However, the correlation between the other TQM factors, top management commitment, employee empowerment and training, quality measurement and benchmarking, customer satisfaction, and organisational culture and the competitiveness were relatively close to each other in all companies irrespective of their business type.

This result matches the reality in Jordan, despite the absence of studies to investigate the impact of TQM implementation in ICT companies in Jordan with which to compare the present study results. However, Nusseir (2001), the Global Information Technology Report (2004 – 2005) and Al-Jaghoub and Westrup (2003) confirmed that, in the Jordanian context, the Internet companies are able to achieve high levels of competitiveness. In addition, Jordan was one of the Arab countries which witnessed great progress in the field of information technology, especially in the area of Internet which gives it great importance, because the government announced that the main

objective of this type of company is to transform Jordan to attract investment in this area.

Currently, many companies provide Internet connection services in all possible ways and means, the Jordanian market attracts Arab and international companies to invest in this area to provide these services in open competition. For example, DSL service entered the Jordanian market in 2001 and the number of subscription customers was more than 409, rising to reach more than 10.000 customers in 2004. These steps have clearly contributed to the increasing numbers of Internet users in Jordan from 127.000 users in 2000 to about 630.000 users in the statistics of 2004 which is considered a high percentage in the Arab region (The Initiative for an Open Arab Internet reports, 2008).

7.3.2.2 Company's size and competitiveness achieving

The findings illustrated that the correlation between TQM implementation and competitiveness had a higher association in the large companies compared with the small ones.

The findings clearly showed that the correlation between the TQM factors re top management commitment, employee empowerment and training, continuous improvement, policy and strategic planning, organisational culture and suppliers relationships were stronger in the case of large companies. However, the association between the other TQM factors, quality measurement and benchmarking, customer satisfaction, quality information systems and organisational culture and the competitiveness were relatively close to each other in all companies regardless of their business type.

This result matches with many of the previous studies which concluded that the larger sized companies are more able to achieve benefits as an indicator of TQM implementation. Ahire et al (1996) mentioned that the large organisations that apply and

implement any form of TQM programmes construct more rigorously and have better product quality than those that do not. Terziovski and Samson, (2000) concluded that large companies tend to gain greater benefits from TQM than smaller firms. Brah et al (2002, pp. 357-377) concluded also the same results when they stated that:

“The success and the eventual benefits due to TQM very much depend on organisational context, including the firm’s size, the nature of its products and industry characteristics.....Larger firms achieve better quality performance than smaller firms”.

However, some other studies which have concluded that there is no relationship between quality and company size; such as Wiele and Brown (1998), who mentioned that larger companies will not be able to improve the quality of their products, services and processes, unless their suppliers or the second-tier-suppliers also grow to a higher level of quality maturity but these results are not consistent with the current study results. This means that the issue of TQM relationship with the size of the companies is still controversial and debated in the literature.

In the case of Jordanian ICT companies, it could note that large companies are more competitive than small ones. This result matches the reality through the fact that large companies remain on the market with continuous growth and work on permanent and renewable offers and their services are clearly shown on the media in Jordan.

In contrast, small companies seems not to be stable in the market and even those that achieve good competitive status in the early stages of their investment, quickly move back and close down their business.

7.3.3 Third objective: To explore the role of environmental factors (government policy and social culture) in encouraging the implementation and sustainability of TQM in the Jordanian ICT sector

Within the current investigation two elements of external environment, government policy and social culture have been chosen to be studied. First, in the Jordanian context, social culture and governmental policy still play fundamental roles in the business environment. Thanassoulis et al. (1994) indicated that the government can play a significant role in encouraging or discouraging strategic quality planning. In addition, it has been suggested that the values and attitudes common in a society can influence the type of information about quality that is available to employees (Choi and Liker, 1995; Kettinger and Lee, 1995; Loveday, 1993). Government leaders recognize the benefits of TQM implementation for economic development (Mersha, 1997).

Second, the studies that present the role and impact of social culture and governmental policy in encouraging or discouraging TQM implementation are limited. Mele and Colurcio (2006) confirm that in TQM literature there is a lack of studies which analyse the contribution of quality management to value creation and diffusion in the perspective of stakeholders. Walker (2000) indicated that the question of developing effective measures of environmental performance is an important gap in the research that needs to be addressed.

The questionnaire showed three main findings related to the role of government. First, the governmental policy in Jordan has had an effective role in encouraging TQM implementation. This policy focuses on encouraging ICT companies and their employees to achieve better performance by presenting them with a special reward called "*The King Abdullah11 Award for Excellence*". This reward is usually given to the best company and individual's performance in both the public and private sectors. Abu-Hamatteh et al. (2003) and Rawabdeh (2008) stated that *The King Abdullah11 Award for Excellence* focuses on five areas called criteria: leadership; strategic planning; process management; resource management; results. The organisation benefits from the award's criteria in a number of ways. For example, it could act as a guideline for performance excellence. Moreover, Mersha, (1997) identified the need for awards that

can have a fundamental impact on the sort of information provided so that the award criteria can become a vital pointer of product quality.

The second finding was about the role of the government policy in identifying the standards and level of service quality in the companies. It was found that governmental policy has set up a specific minimum level of quality services that must be met by ICT. Moreover, in order to formalize this idea, the Jordanian government has established organisations which are responsible for measuring the company's quality of service. Osuagwu (2002), in his article, discussed the role of governmental policy in Nigerian organizations in improving its competition. He stated that *"the governmental policy has substantially impacts on TQM strategies in Nigerian companies with competition"* (Osuagwu, 2002, p150).

The third finding was about the role of taxation as government policy on TQM implementation. The results showed that this element had the lowest score among governmental factors that play a vital role in encouraging TQM implementation within Jordanian ICT companies. The taxation policy in the Jordanian context does not encourage TQM implementation. Al-Shaikh, (2003) stated that

"The visitors to Jordan can easily observe that Jordanians are always complaining about the different types of tax they have to pay".

Furthermore, the questionnaire findings revealed that social culture in Jordan plays essential roles in TQM implementation in ICT companies. The results showed that the educational institutions in Jordan provide ICT companies with well-educated workforces who are qualified and able to provide a high level of TQM implementation. This result is not consistent with the study of Gosen et al. (2005) in which they found that many developing countries have low levels of literacy. Jordan is unlike other developing countries. At the beginning of 1952 the literacy rate was 33% and grew to 85% in 1996; according to the 2005 estimate 91.3% of the total population (Ministry of Education, 2007).

Moreover, the questionnaire findings disclosed that Jordan's community culture demands a continuous development of customer services quality. However, the customers' findings showed that the focus on product quality and services provided by the company more than the price scored the lowest mean compared with the other statements in local culture role in implementing TQM. In addition, the interview with regular visiting customers reported that 22 out of 45 of them focused on quality services more than price, while 23 stated that they focused on service price because the price of services provided by ICT companies are high compared with their low income.

The General managers and TQM managers' interviews reported that two important external environmental factors that play significant roles in encouraging TQM adoption and implementation for Jordanian ICT companies are governmental reward policy and the governmental quality standardization. However, the local community culture demands for continuous development of service quality and governmental taxation policy have a negative effect on their companies and are considered as barriers for applying TQM in ICT companies in Jordan because the government imposes high taxes and fees on their companies which forces the companies to pay less for quality.

One general manager stated:

“In Jordan, the taxation which imposes on the companies' revenues has the highest proportion of taxes. These high taxations reduce the companies' ability to achieve the success that the companies anticipate to do such as applying TQM programme”.

Regarding the discussion about this objective and the questionnaire and interview results the following conclusions could be drawn.

- The government policy of reward and quality service level has a significant role in encouraging TQM implementation in Jordanian ICT companies.

- The government taxation policy discourages TQM implementation in Jordanian ICT companies by imposing high taxes and fees on companies' revenue.
- Regarding the social culture, educational institutions in Jordan provide ICT companies with well-educated and qualified workforces that are able to provide high level of TQM implementation,
- Customers' culture still focuses on price more than quality.

7.3.4 Fourth objective: To identify the main impediments of the adoption of TQM in the ICT sector in Jordan

This section introduces the impediments of TQM adoption and implementation in Jordanian ICT companies. It has been found from the questionnaire findings that the most effective impediments and barriers that prevent TQM implementation in Jordanian ICT companies were the weakness of attention to total quality of the organizations' culture, weakness of commitment to employee empowerment and weakness of commitment in achieving continuous development. These impediments scored the highest mean within the current study.

However, the questionnaire results revealed that the weaknesses of attention of the supply chain relationship, focusing on customer satisfaction and their expectations, commitment of the total quality strategy requirements, lack of top management commitment and belief in the programmes of TQM, lack of using quality measurement and benchmarking, poor organisational communication and inefficient information systems used in the company had the lowest score of all the impediments measured within the current study which indicates that these factors do not prevent TQM implementation in Jordanian ICT companies.

As mentioned before, the questionnaire results disclosed that weakness of attention to total quality of the organisation's culture had the highest score of all the impediments

that hamper the implementation of TQM programmes and philosophy in Jordanian ICT companies. This result is consistent with the results of studies conducted in developing countries. Al-Qudah (2006) emphasized this result in his study when he said that the major barrier that might face the implementation of TQM strategies in Jordanian companies is organizational culture. Moreover, Al-Zamany et al (2002) in their study in Yemen, and Baidoun (2004), in his study in Palestine, considered organisation culture the major barrier to TQM implementation. Hansson and Klefsjo (2003) mentioned that developing a culture and climate to support TQM is much more difficult than implementing TQM in an already receptive environment.

It has been found that weakness of commitment to employee empowerment scored the second impediment to hamper TQM implementation in these companies. The reason behind this result is there is misunderstanding of employee empowerment as a TQM significant factor within the Jordanian ICT companies. This result is consistent with AL-khalifa and Aspinwall's (2000) study in Qatar. They reported that the main barrier that faces implementing TQM in Qatar is the lack of empowerment in the company to provide training programmes.

Lakhe and Mohamty (1994) mentioned that lack of employee empowerment is considered as the main impediment to TQM implementation in developing countries. Furthermore, weakness of continuous development is considered as an effective barrier for applying TQM programmes within Jordanian ICT companies. It recorded the third highest score among other impediments within the current investigation. The rapid changes in technology in the business environment and the market place make companies and employees unable to cope with the market place requirements. The same result has been reported by Al-Qudah\ (2006) in his study in Jordan. He mentioned that continuous improvement is one of the most effective barriers that prevents applying TQM in the pharmaceutical industry companies in Jordan.

The interview findings supported those of the questionnaire. 87.5% of the interview participants mentioned that organisational culture is considered as the major impediment that prevents TQM implementation within their companies. One of the TQM managers stated that:

“The core barrier within the organization is culture.”

Another manager stated that:

“Although we apply TQM strategies, our employees still have negative perspectives about the needs of the TQM strategies in the companies.”

In other words, some employees prefer to keep the old way of working rather than the new one because they consider any changes, including adopting new culture, need more effort and time. So, they believe that traditional culture is more comfortable and less confusing.

New dimensions regarding organisational culture as an impediment to TQM in Jordanian ICT companies were introduced by the managers who took part in the interview process. These new dimensions are nepotism and “Wasta”.

Nepotism, as a term, is much related to the term ‘collectivism’ that was mentioned by Hofstede (2001). Webster’s International Dictionary defines nepotism as *“favouritism shown to nephew and other relative, by giving them positions because of their relationship rather than their merit”* Webster’s International Dictionary, 1976, p1510). Ford and McLaughlin (1986) mentioned that nepotism has a negative impact on an employee’s behaviour; family relationships get mixed up with business decisions because people cannot be sure if they have been hired, promoted or given a rise on the basis of their actual performance or kinship.

Recalling the fifth Hofstede dimension, that Arabic business culture is always characterised by high collectivism and femininity (Hofstede, 1997, 2001), the current situation in Jordanian companies is reflected in the words of TQM managers

“The problem with us is that we live with tribal and kinship relationships. That effects negatively on our business processes and relationships”.

On the other hand, “Wasta” is the term used in the Jordanian context to reflect the role of the personal and family relationships in developing the business process. “Wasta” usually holds a negative meaning because people usually use it when an illegal or unusual process is developed. Hutchings and Weir (2006, p278) defined Wasta as *“intrinsic to the operation of many valuable social processes, central to the transmission of knowledge and the creation of opportunity”*.

Moreover, Sawalha (2002) stressed that the role of “Wasta” in the business sector is developing the business process based on personal gains which commonly stand for favouritism, cronyism and dishonesty in general. Also, he stated that the Arab World is based on strong family connections secured in Wasta networks.

Furthermore, some studies in Arab management signify that organisations in Arab countries nowadays face many organisational and managerial problems, starting from their bureaucratic design and existing power culture (Sabri, 2007).

The interviews presented three other main barriers that are related to the government policy. The first one is government policy in giving license. Government policy of giving new companies a licence to run a business is recognized as a barrier because, in the current Jordan situation, the government gives new companies a licence to run a business without testing the established companies’ strategies which effects badly in the business process. AL-Zamany et al. (2002) in their study in Yemen, state that many organisations in the Middle East have not acted as commercial organisations because of variety of forms of government intervention. Taxation is the second barrier which emerged from the interviews. Al-Shaikh (2003) stated that it can be observed that

Jordanians are always complaining about the different types of tax they have to pay. The final and third barrier is government bureaucracy in applying TQM in Jordanian ICT companies.

Building on the previous discussion about the impediments of applying TQM in Jordanian ICT companies the following conclusions can be made.

- Inappropriate organisational culture is considered the most effective impediment that hampers TQM implementation in Jordanian ICT companies.
- The lack of employee's empowerment and continuous improvement are considered other barriers to hamper TQM implementation in ICT companies in Jordan.
- The government policy relevant to taxation and giving licenses to new companies and the bureaucracy attached to these issues are considered other impediments that hamper TQM implementation in ICT companies in Jordan.

7.4 Chapter summary

The aim of this chapter is to summarize and draw out the findings and results that have emerged from the current investigation. As presented previously, the study aimed to achieve four objectives. The first objective findings show that ICT companies in Jordan apply top management commitment, quality communication and structure, employee's training, quality measurement and benchmarking, customer focus and satisfaction, quality information system, policy and strategic planning and supplier's relationships as vital TQM factors. Moreover, one factor that emerged from the empirical study is social responsibility. On the other hand, the empirical study shows that ICT companies misunderstand and have less awareness of other factors that might effect TQM implementation. These factors are organisational culture, misunderstanding of continuous improvement and lack of employee's empowerment.

The second objective shows that implementing TQM factors in ICT companies in Jordan have been positively effective on the companies' competitiveness. This impact materializes in the profitability, service quality, effectiveness and market share. Moreover, the semi-structured interviews revealed another business result which is the companies' good reputation.

The third objective aimed to explore the expected roles of the external environmental factors in encouraging TQM implementation. The results show that government policy offered limited procedures that encourage TQM implementation. These procedures are governmental reward, the governmental policy of quality services level and educational institutions that supply the ICT companies with professionals and expert staff. The study also illustrates the discouraging factors that effect TQM implementation, government policy taxation and customer's social culture. 50% of the customers focussed on service and the product's price rather than quality. The reason behind this is the limitation of the individual's budget and the increase in the service price.

The fourth objective aimed to identify the expected impediments that might face TQM implementation. The empirical study shows that ICT companies in Jordan face many barriers:

1. weakness of attention to the total quality of the organisation's culture, most importantly nepotism and "Wasta"
2. the policy of employee empowerment
3. weakness of continuous improvement
4. the government role through:
 - the taxation policy
 - giving licences to new companies
 - bureaucracy.

Chapter Eight

Conclusions, Contributions and Recommendations

8.1 Introduction

This chapter summarises the conclusions for each objective of this research which emerged from the findings in chapter six and the discussion in chapter seven. As a main aim of the research, a model to help in the implementation of TQM in the ICT companies in Jordan is developed and is presented within this chapter. Also, this chapter presents the contribution of the study on two levels, academic and empirical; some recommendations for further research are presented. Then, reflections and limitations are discussed.

8.2 Conclusions

Based on the analyses of the quantitative and qualitative data, as presented in chapter six and discussed together in chapter seven, the following summary of the main findings and conclusions were derived. Also, a mapping of research questions to data capture questioning is presented in appendix E as a summary.

8.2.1 Conclusion of objective one

The adoption of ten TQM factors in the ICT sector in Jordan is discussed in the following key points section.

a. Top management commitment

Top management commitment is considered as a valuable and critical TQM factor by Jordanian ICT companies. The companies employed this factor through being explicitly committed to quality, assuming active responsibility for the evaluation and improvement

of management system and allocating adequate resources and time for quality management.

The vast majority of general managers and TQM managers in the ICT companies are aware of the significant role that the commitment of top management could play in implementing TQM factors in their companies.

b. Quality communication and structure

In the Jordanian ICT sector, the factor of quality communication and structure is applied in the TQM process. There is a communication network across departments at all levels within the companies. Furthermore, communications between managers and employees are considered a significant process in implementing their business strategy and productivity improvement. Moreover, the elements of quality management structure are in place to manage the companies' quality and to facilitate their quality strategy objectives.

c. Organisational culture

One of the critical results of this study, which has emerged from the findings and discussions of this factor, is the adoption of inappropriate organisational culture to support TQM implementation in ICT companies in Jordan. There are two dimensions related to the organisation culture that have emerged from the study, Wasta and nepotism, which are well known phenomena in the Jordanian culture. These dimensions are considered to have a negative impact on the implementation of TQM in Jordanian ICT companies.

d. Employees empowerment and training

Summarizing the keys findings shows that most Jordanian ICT companies provide training programmes, such as communication skills, effective meeting skills and leadership skills, with high priority and attention. However, there is a lack of understanding of the value of empowering the employees' suggestions and engaging

them in the companies' decision making. Therefore, it could be concluded that employee's empowerment should be studied as a separate factor from training in the Jordanian context.

e. Quality measurement and benchmarking (QMB)

It is concluded that QMB is considered an important factor to apply and implement TQM strategy in ICT companies in Jordan. This factor can be implemented through the awareness of the concept of benchmarking and TQM measurements. It is considered by the majority of the general and TQM managers as a valuable and beneficial factor for applying and implementing TQM. Moreover, the customer's feedback in Jordanian ICT companies is considered as the most important measurement tool to be adopted.

f. Continuous improvement (CI)

No clear evidence was found that Jordanian ICT companies are aware of the means and value of adopting continuous improvement. Therefore, it can be concluded that Jordanian ICT companies face relatively limited application and lack of awareness of continuous improvement.

g. Customer focus/ satisfaction (CFS)

The summary of the findings related to CFS indicates that the vast majority of Jordanian ICT companies are aware of the meaning and the value of CFS. It is concluded that CFS exists and is adopted in ICT companies in Jordan with high consideration given to its value.

h. Quality information systems (QIS)

One of the critical results of this study which has emerged is that ICT companies in Jordan have significant interest in adopting QIS. Moreover, it can be concluded that using quality information systems increases the quality level of the service and, in turn,

fulfils and satisfies the customer requirements by providing all the information needed about the company products and services.

i. Policy and strategic planning (PSP)

A summary of the findings related to the PSP factor in this study shows that ICT companies in Jordan consider PSP as a critical factor in TQM implementation. The managers are fully aware of the need for effective adoption of PSP for gaining successful TQM implementation. However, some companies in the Jordanian ICT sector are worried about the external factors in the market environment and the negative effects on the strategic planning, such as the instability in the Middle East region.

j. Supplier's relationships (SRs)

It can be concluded that SRs is considered an important factor in TQM implementation in Jordanian ICT companies, in terms of the suppliers' selection and having long term relationships with them. The SRs factor is implemented and the companies are aware of its role in improving their performance and quality.

k. Social responsibility (SR)

This factor was not measured in the questionnaire; however, it emerged from the interview process and was mentioned by three managers. The researcher concludes that SR is considered a new phenomenon not studied in Jordan in general, and not in ICT companies in particular.

Comparison of TQM success factors between Jordan and other countries

Table 8.1 shows the critical TQM success factors in the USA, UK, UAE, Hong Kong, Japan and Jordan based on this study.

Table 8.1 comparison critical success factors for TQM implementation in different nation

Nations	Critical success factors for TQM implementation	Reference
USA	<ul style="list-style-type: none"> •Top management leadership •Role of the quality department •Training •Product design •Supplier quality measurement •Process management •Quality data reporting •Employee relationship 	Saraph et al., (1989)
UK	<ul style="list-style-type: none"> •Effective leadership •Application of best practice •Economic survival •Market orientation •Employee involvement 	Warwood and Roberts, (2004)
Japan	<ul style="list-style-type: none"> •Management thinking driven by TQM •Employee involvement and commitment at all level (down-up) •Total dedication to achieving customer satisfaction •Innovations as a supplementary process to TQM •Long-term planning 	Chase, (1988)
Hong Kong	<ul style="list-style-type: none"> •Training and education •Quality data and reporting •Management commitment •Customer satisfaction orientation •Role of the quality department •Communication to improve quality •Continuous improvement 	Antony et al., (2002)
UAE	<ul style="list-style-type: none"> •Role of the divisional top management and quality policy •Role of quality department •Training •Product and service design •Supplier quality relationship •Process management •Quality data and reporting •Employee relations 	Badri et al., (1995)
Jordan	<ul style="list-style-type: none"> •Top management commitment •Employee training •Customer satisfaction and focus •Quality communication and structure •Quality information system •Policy and strategic planning •Supplier relationship •Quality measurement and benchmarking 	Based on the current study

8.2.2 Second objective

The impact of TQM implementation in improving the ICT companies' competitiveness

One of the critical results of this study which has emerged is the impact of TQM implementation on improving the companies' competitiveness. It can be concluded that TQM in ICT companies in Jordan enables them to increase and improve the profitability, diversity and quality of services and products, effectiveness and market share. The findings show that TQM implementation and adoption have a positive impact on profitability, quality of service, effectiveness and market share.

Moreover, there is a new dimension related to companies' competitiveness that has emerged from the study; the companies' reputation as a result of implementing TQM

philosophy. It has been found that the ICT companies in Jordan which apply TQM have a good reputation in the market which, in turn, improves the companies' competitiveness.

The results of this study indicate that large ICT companies in Jordan are most affected in achieving benefits of applying and adopting TQM philosophy compared with the small ones.

The Internet companies were more able to achieve TQM benefits than mobile and land companies.

8.2.3 Third objective

Exploring the role of external environmental factors in encouraging TQM implementation and sustainability

The critical finding is that the government policy's on reward and governmental policy of quality of service level have significant roles in encouraging TQM implementation in Jordanian ICT companies, while the governmental policies of taxation giving new licences discourages, and has a negative effect on, TQM implementation in Jordanian ICT companies. Although the educational institutions in Jordan provide ICT companies with well-educated and qualified staff able to provide effective TQM implementation, the customers' culture still focuses on product price more than product quality. From this perspective it can be concluded that customer culture plays a negative role in applying TQM in Jordanian ICT companies.

8.2.4 Fourth objective

The impediments that hamper TQM implementation in ICT companies in Jordan

There is clear evidence that there are a number of impediments and barriers which prevent and hamper the adoption and implementation of TQM in Jordanian ICT companies. It has been concluded that the most important impediment was the limited

attention to total quality in the organizations' culture. Moreover, nepotism and “Wasta” are considered new dimensions relevant to organisational culture that have a negative effect and are problematic in applying TQM to Jordanian ICT companies. The second impediment is employee's empowerment. The weakness of adopting continuous improvement is another impediment that can be added in this context. High taxation, the policy of giving licenses to new companies and bureaucracy are considered other impediments that hamper TQM implementation in ICT companies in Jordan.

Comparison of the TQM impediments between Jordan and other countries

Table 8.2 shows a comparison of the TQM impediments in USA, UK, Yemen and Jordan.

Table 8.2 comparison of impediments for TQM implementation in different nation

Nation	Impediments to TQM implementation	References
USA	<ul style="list-style-type: none"> •Insufficient time •Poor communication •Lack of real employee empowerment 	Salegna and Fazel (2000)
UK	<ul style="list-style-type: none"> •Lack of upper management commitment • Lack of training programmes •Organisations do not place enough impotence on cases of goods returned nor relate such cases to customers •Suppliers relationship and involvement. •Insufficient teamwork facilitators •Worker evaluation lacks a systematic approach and hence salary adjustments are not commensurate with job function 	Adebanjo and Kehoe (1998)
Yemen	<ul style="list-style-type: none"> •Lack of top management commitment •Inappropriate culture •Lack of quality measurement •Lack of employees empowerment •Lack of government support 	Al-Zamany et al (2002)
Jordan	<ul style="list-style-type: none"> •Inappropriate culture •Lack of employee empowerment •The weaknesses of continuous improvement adoption •Government policy includes: <ul style="list-style-type: none"> ▪High taxation ▪Giving license ▪Bureaucracy 	based on the current study

Table 8.2 shows the impediments for TQM implementation in USA, UK and the Yemen and the impediments in the ICT companies in Jordan based on the current study results. It could be seen that the impediments in Jordan are somewhat similar to those in the Yemen. Inappropriate culture, lack of employee empowerment and government support are considered to be the main impediments for TQM implementation in both countries.

8.2.5 Presenting the proposed model

The model proposed in the study structured its main component from critical TQM factors identified from several non- Jordan specific studies, such as Al-khalifa and Aspinwall (2000), Chapman and Al-Khawaldeh (2002), Alomaim (2002), Abu-Hamatteh at el (2003), Baidoun (2004) and Al-Qudah (2006) these were carried out in the Middle East and indicated that there are nine common TQM factors (top management commitment; quality communications and structure; employee empowerment and training; continuous improvement; customer focus; quality measurement and benchmarking; policy and strategic planning; organisational culture; supplier's relationship). In addition to these nine TQM factors, quality information system (QIS) is also investigated as a tenth factor within Jordanian ICT companies.

In addition, TQM implementation benefits were taken into account in forming the model. The assumption made in developing this model is that company competitiveness is the main advantage of TQM implementation within Jordan ICT companies. This assumption is based on Al-Qudah's model in his study that was undertaken in Jordanian pharmaceutical industry companies (2006). He studied the impact of adopting total quality strategy in improving competitiveness. He measured company competitiveness by service quality, profitability, effectiveness and market share. In this study the same factors are used to measure competitiveness within Jordan ICT companies.

The roles of the external environment is added to the model based on the important role that are played by government and national culture in encouraging or discouraging companies in applying TQM in Jordan and the developing countries.

The previous issues are found to be critical in the implementation of a TQM process in ICT companies in Jordan. However, a number of barriers that prevent TQM implementation in these companies were considered within the proposed model.

Basically, the assumption of the model is derived from the literature and the studies that are undertaken in the TQM field. However, the findings that came from the data of the study that were compiled from Jordanian ICT organisations under investigation represented a thorough integration of the quantitative and qualitative data. The model provides a comprehensive basis for TQM implementation appropriate to Jordanian ICT organisations.

TQM implementation in the Jordanian ICT sector is demonstrated through the model displayed in figure 8:1. The ten TQM factors stated in the literature are shown, as well as the factor which appears from dividing the factor of employee empowerment and training into two factors: empowerment (as the 10th factor) and training (as the 11th factor) which resulted from the empirical study as two different concepts with different approaches of implementation in the ICT sector. Furthermore, a 12th factor emerged from the empirical study, which is social responsibility. Therefore, the researcher is presenting this model with the 12 TQM factors which have been studied. Two of the factors were not clearly linked to TQM application through the empirical study; the factor of social responsibility was not highly evident from the empirical study. However, there was evidence from the empirical study that only 8 out of the 12 TQM factors are applied effectively within Jordanian ICT companies in order to achieve their competitiveness. The concept of competitiveness is presented in this model through the factors of profitability, effectiveness, market share and service quality (from the literature) as well as the companies' reputation as a 5th element which appeared in the empirical study.

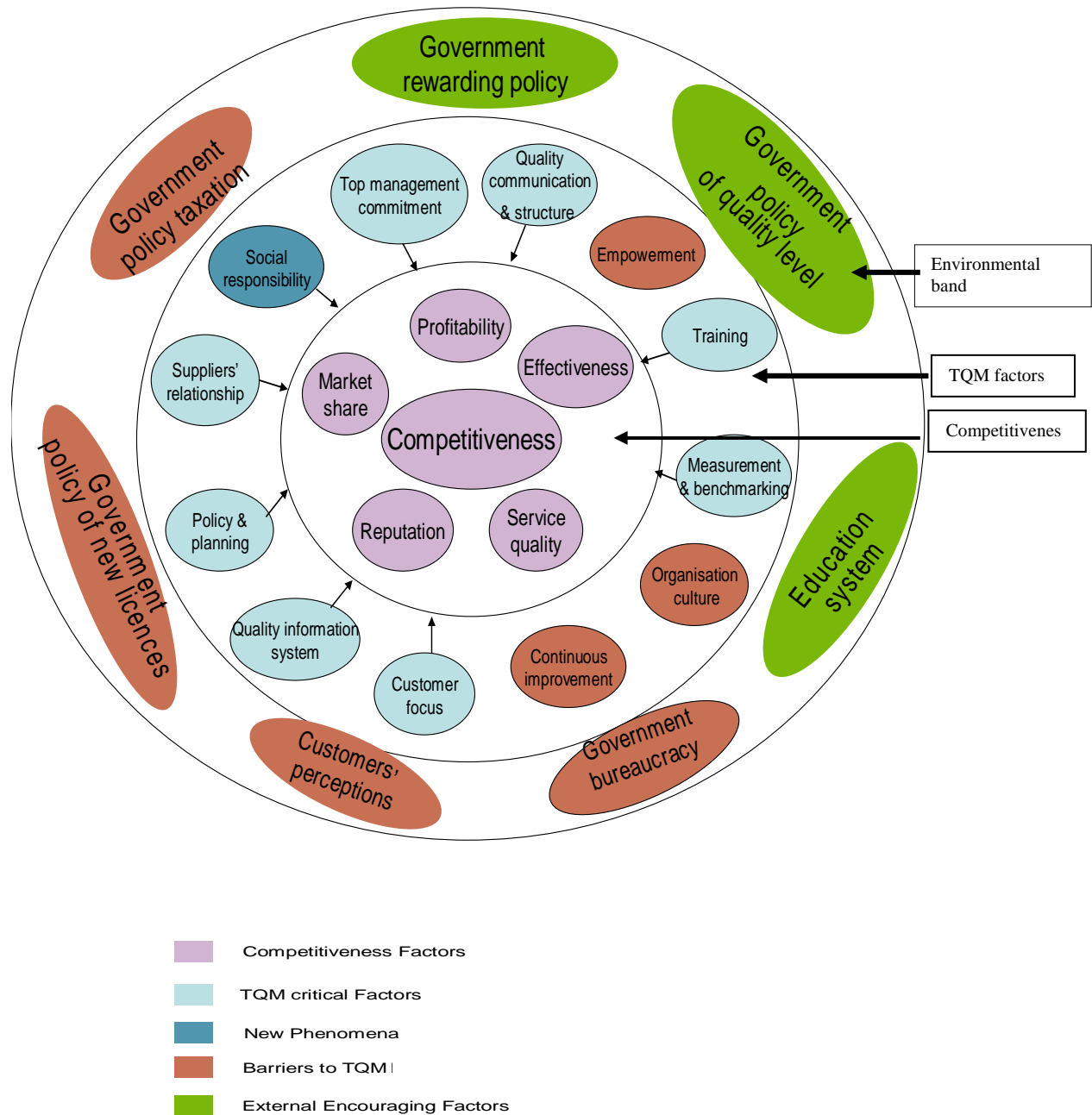
Moreover, the model takes into consideration the external factors which might encourage or discourage the implementation of TQM in ICT companies. On one hand, the factors of government rewarding policy, government policy of identifying the quality

levels and the education system as the source of qualified staff are seen as encouraging factors. On the other hand, the factors of governmental taxation policy, the governmental policy of new licences government, bureaucracy and the customers' perceptions regarding quality which give priority to the pricing of the service rather than its quality as the discouraging factors.

Finally, the factors of organisational culture, employee empowerment and the continuous improvement act as internal barriers to the successful implementation of TQM as they are not effectively applied and have a relatively negative role in the application of TQM in the studied companies while the external barriers are represented by the new licensing policy, the taxation policy, government bureaucracy and the customers' price sensitivity.

This model is derived from the research finding representing the current TQM implementations in Jordanian ICT sector. The model may be generalised to other organisations in Jordan and to other developing countries. Figure 8.1 shows and summarises this proposed model

Figure 8.1 Summary of the study's proposed model



According to the finding of the study and the current situation of ICT companies in Jordan, the following is dissection of the strengths, weaknesses, opportunities and threats of the proposed model.

Strengths

- 1- This is the first model to be developed to assess TQM implementation in ICT companies in Jordan.
- 2- It shows the current situation and calls for future improvements in relation to the highly implemented factors and those with less implementation.
- 3- It highlights a problem in relation to organisational culture and the reason behind considering it as a barrier to successfully implement TQM in ICT companies in Jordan. It identifies that the national culture reflects negatively on the organisational culture through the negative effect of Wasta and nepotism on the implementation of TQM.
- 4- This model was built not only by considering the internal environment in the companies and the ICT sector, but also it took into consideration the role of external environment; for example, customers claimed that price is more important than quality.
- 5- It shows the positive effect of TQM implementation on companies' competitiveness as one of the major concerns for the ICT companies.
- 6- It presents the importance of adopting IT as a key trend in business in TQM through successful implementation of the quality information system.

Weaknesses

- 1- This model may not be that useful in small ICT companies to the same extent as it is in large companies (refer to 7.3.2,2).
- 2- Social responsibility factor is not very well defined in the model in relation to TQM implementation.

- 3- This model was built and tested in the ICT sector in Jordan, which involves examining the TQM implementation in international and franchised companies working with large international companies (such as France Telecom), which may limit this model to ICT companies and not to be used by other sectors in Jordan.

Opportunities

- 1- As the Jordanian government is putting much effort into reducing the effect of nepotism and Wasta on the business performance, this factor may not be a barrier to implementing TQM in Jordan in the future. This point may enhance TQM implementation in wider manner with less limitation.
- 2- It will contribute to achieving a higher position in the global competitiveness rank by paying attention to the importance of implementing TQM in Jordan.

Threats

Because Jordan is located in the heart of a conflict-ridden and unstable region and faces rapid changes in its economic, social, legal and business environment this model might be limited to the current period and current economic and business situation.

8.3 Contributions

This research provides a number of contributions to knowledge at academic and practical levels as an important first exploratory empirical study to target all the ICT companies in Jordan. The following sections present the academic and practical contributions of this study.

8.3.1 Academic contributions

The study provides empirical evidence of the academic body of knowledge.

- This is the first study to investigate TQM practices in the ICT sector in Jordan. Therefore, it is considered an attempt on the way to theory building relating to TQM in Jordanian ICT companies.
- The review of the literature in these fields has revealed gaps and the need for more empirical studies to be conducted; therefore, this study integrates, refines and extends the empirical work conducted in these fields and fills some of the gaps in the literature of these fields, such as external stockholders and its influence and effect on encouraging or discouraging the companies in adopting TQM.
- This research has further identified that effective information systems play a significant role in successful TQM implementation, an issue that is not well demonstrated in the literature. In the Jordanian context, this study is considered the first to investigate the role of this factor in the TQM practices in all the sectors (refer to 7.3.1.h).
- This study provides empirical evidence of the nature of the impact of the TQM factors on the companies' competitiveness (profitability, service quality, effectiveness and market share) (refer to 7.3.2).
- This study has revealed that, in the Jordanian context, employees' empowerment should be studied as a TQM factor and separated from employees training, unlike other studies in the field of TQM that considered them as one factor (refer to 7.3.1.d).
- The study gives attention to social responsibility as an important TQM factor. This factor has not been studied in Jordan previously (refer to 7.3.1.k).

8.3.2 Empirical contributions

This research provides a number of contributions at the empirical level

- It provides empirical evidence of some important areas of TQM practice including the nature of TQM factors that are adopted in ICT companies and an understanding of the current situation for implementing a TQM philosophy in

them. The issues that are related to TQM activities in Jordanian ICT companies are presented throughout the study. It is important to stress that one of the main research questions and objectives was to explore and suggest what needs to be done in order to improve the TQM situation in Jordanian companies (refer to 7.3).

- It provides empirical evidence of the nature of the impact of TQM implementation on ICT companies' competitiveness as a strategic objective in any business, which helps the companies in identifying their approaches in relation to achieving a competitive advantage (refer to 7.3.2).
- This study has provided useful guidelines in the form of the critical elements and factors that can enhance success in TQM implementation as well as the business results of TQM implementation, such as increase profitability, improve service quality, increase effectiveness, market share growth and good reputation. It provides assessments for the effectiveness of the current practices relating to the implementation and evaluation processes of TQM, reflects all the related problems and challenges internal and foreign companies (refer to 7.3.2).
- It provides empirical evidence of the impediments and challenges that hamper and face TQM implementation in Jordanian ICT companies, such as the weakness of the organisational culture (refer to 7.3.4).
- The study recommends that managers give social responsibility (as ethical responsibility to employees and external environment) more attention as part of their companies' strategies (refer to 7.3.1.k).
- This study raises the awareness of the significance of TQM programmes as important, strategically and philosophically, which could help companies to have a better understanding of how TQM could be effectively approached and implemented (refer to 7.3.1).

8.4 Recommendations

The fifth objective of the research, given in Section 1.3, is to propose practical suggestions and recommendation to support the adoption of TQM and tackle the problems and challenges which exist in the ICT sector in Jordan. Managers need to consider all the suggested critical points presented in the previous sections in addition to the following implications.

- These companies could develop a strategy for implementing TQM by paying more attention to the identification, analysis and adoption of an appropriate organisational culture that suits TQM implementation (refer to 7.3.1.c and 7.3.4).
- Social responsibility needs to be considered seriously in two dimensions: companies' responsibility towards its staff should be improved, as well as companies' ethical and social responsibility towards their customers and the external environment (refer to 7.3.1.k).
- Employee's empowerment is an important issue in TQM implementation; thus, Jordanian ICT companies should pay more attention to how to satisfy those employees and increase their empowerment (refer to 7.3.1.d).
- It is important that these companies pay more attention to communication as an element which enhances the internal and external performance of the company.
- Continuous improvement is a significant factor in TQM. The companies need to give this farther attention in terms of the awareness and the value of its implementation (refer to 7.3.1.f).
- Government should review its policy regarding the taxation and the policy of giving new licences in order to encourage the companies to adopt and achieve quality, which increases the companies' profitability and, hence, reflects on the value of GDP (refer to 7.3.3 and 7.3.4).

8.5 Recommendations for further research

- Researchers, in the Jordanian context in particular, and in the developing countries in general, should study employee empowerment as a TQM factor separate from training (refer to 8.2.1.d).
- Researchers are recommended to study the role of the quality information system as an important TQM factor (refer to 8.2.1.h).
- Organisational culture as a factor of successful TQM implementation requires further research. It is necessary to assess its suitability, especially in the developing countries where the issue of culture is critical and where it has an effect on the business environment as well as the social environment (refer to 8.2.1.c).
- Social responsibility is a factor which is worthwhile to be studied in further research in order to assess its importance in the TQM context (refer to 8.2.1.k).
- It is demonstrated that TQM has an effect on companies' competitiveness. Therefore, other TQM implementation consequences, such as increased levels of efficiency and productivity, improved employee morale and motivation, the elimination of defects, reductions in scrap and rework, reduced cost and excellence management, should be studied in order to integrate TQM into different management aspects and processes.
- There is a lack of understanding of the significance of external environmental influences in facilitating successful TQM implementation, such as the role of the government and the impact of the local culture principles (refer to 8.2.3). Therefore, further attention should be paid to this role as it suffers from little research.
- Based on the rapid changes of the technological innovations in relation to the ICT sector all over the world, plus the reports about the closing down of many ICT businesses in the recent years, especially the internet companies, research efforts to investigate the reasons behind closing these companies and their relation to TQM are recommended.

- Wasta is a well known concept entrenched within the Arab culture. It affects negatively on TQM adoption and other modern management philosophies. However, it is never acknowledged as an issue to be managed. It requires a formal and focused study to understand the implications of Wasta for the long term success of TQM and other improvement initiatives.
- The mix between quantitative and qualitative analysis is unusual in the majority of similar studies in Jordan. In the past researchers have only used questionnaire and quantitative analysis. In order to maximise the effectiveness and reliability of their work in this area researchers should be encouraged to utilise both quantitative and qualitative approaches.
- The proposed model provides a foundation to give other researchers the opportunity to develop and extend. It is possible that researchers could extend it to include other TQM factors that were not studied in the current research. Possible examples are: resources management; systems and process management; union management relations; product and service design. Moreover, more attention and further investigation could be given to social responsibility and its role in applying TQM. The model could be expanded to involve other TQM benefits such as performance.
- External validity for the study and model was tested by re-contacting the original respondents and organisations and confirming the research findings and appropriateness of the model. Other researchers could develop the sample to other organisations and test the model validity.

8.6 Research reflections and limitations

- Data collected from the customers was used in a small part of the research; however, customer satisfaction is an essential area in TQM, therefore, a limitation is recorded here that the dimension of customers' perceptions of

quality could be investigated further to provide a deeper triangulation in the data collection and evidence interpretation.

- Interviews were conducted with the general and TQM managers in the sampled companies but the TQM employees are also an important source of information. It is admitted that interviewing TQM employees could add another scope to the study, in relation to empowerment, for example.
- Although the research approach of observation is recognised as an effective data collection method, this approach was not used within this study. Assessing TQM implementation within ICT companies through observing the performance and management behaviour could give a clearer view of TQM issues.
- The role of government in TQM was identified here to be of great importance; however, it has not been studied from the point view of government officials evaluating their procedures and policies in relation to TQM implementation.
- There was a lack of literature on quality management in Jordan and other Arab countries because little research has been conducted as TQM is considered a relatively new phenomena and concept.
- There is limited data and information available about TQM efforts and activities in ICT companies; such information is important to support the study results.
- The study model did not indicate a strong relationship between a company's size and TQM implementation benefits. This point needs further investigation in order to get full results and explain reasons behind such a result.
- Causality is in part taken for granted, in that the increased competitiveness of an organisation studied is taken as a consequence of improvements brought about by purposeful changes in the quality of systems and processes. It is however possible that an organisation could prosper due to some other reason or influence than those brought about by the implementation of TQM. However, the factors selected at the beginning of the study to indicate changes in competitiveness were selected to take account of this issue. Further research could be undertaken in a sample of the study organisations to clarify or confirm the detail of the relationship between the implementation of TQM and increased competitiveness.

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Appendices

Appendix A

The Study Questionnaire



An Evaluation of the Implementation of Total Quality Management (TQM) within the Information and Communications Technology (ICT) Sector in Jordan Questionnaire Survey

Dear participant

I am a PhD candidate currently conducting research in the area of total quality management. The primary aim of my research is to evaluate the implementation of Total Quality Management within the information and communications technology (ICT) Sector in Jordan. All responses will be treated with the utmost confidence, the results of the survey will be used for research purposes only and no attempt will be made to identify an individual or organisation. I would very much appreciate your participation and help since the success of this research depends upon your response

Please attempt to answer every question; there are no right or wrong answers. I am seeking your judgement or opinion only.

I look forward to receiving your reply

sincerely yours

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Part 1:

To help us classify your responses statistically, may we ask you a few questions about yourself and your organisation?

Firstly: data about respondents

1. Gender

- ☐ Male ☐ Female

2. Age

- ☐ 20-30 ☐ 31-40
☐ 41-50 ☐ Over 51

3. Your current position

- ☐ General manager ☐ TQM manager ☐ TQM employee

4. Number of years of your personal involvement in quality management

- ☐ Less than 3 years ☐ 3 –6 years
☐ 7 to 10 years ☐ More than 10 years

5. Educational level

- ☐ High school or equivalent
☐ Bachelor
☐ Postgraduate

Secondly: data about company

6. Company ownership

- ☐ Public shareholding company ☐ Private ☐ Other

7. Current market region

- ☐ Local ☐ Regional
☐ Local and regional ☐ International

8. Company ownership type

- ☐ National ☐ International branch
☐ Franchise of international company ☐ Strategic sharing

9. Company standardizations

- ☐ Only Jordanian ☐ ISO

10. Employee numbers

- ☐ Less than 100 ☐ Equal or more than 100

11. Company class

- ☐ Cellular ☐ Data communications service ☐ Land telephone or other

Part 2

The following statements describe elements that constitute effective TQM. In answering this questionnaire you are providing your opinion as to how effectively your company implements each of these elements. A response, therefore, of strongly disagree indicates that, in your opinion, your company does not perform well in respect of that element. A response of strongly agree, in contrast, indicates that you believe your company performs very well in that element.

Please tick (✓) in the box that best reflects your answer where

- 1= Strongly disagree 2= Disagree 3= Neither agree nor disagree
4= Agree 5= Strongly agree

No	Quality –related factors	1	2	3	4	5
1	Senior executives assume active responsibility for the evaluation and improvement of management systems and for leading quality drive					

2	Senior executives are visibly and explicitly committed to quality					
3	There is an inclination of top management to allocate adequate resources and time for quality management efforts					
4	There is a formal cross-functional communication structure /system in place					
5	There is a clear and consistent process for the communication of mission statement and objectives defining quality values, expectations and focus					
6	Elements of quality management structure are in place to manage the organisation's quality journey					
7	Major elements of quality management structure are in place to facilitate the organisations quality strategy objectives					
8	Employees are encouraged to accept responsibility for quality					
9	In your company most employees' suggestions are implemented					
10	There is a system for the recognition and appreciation of quality effort and success of individuals and teams					
11	There is a system that links reward to employees' quality achievement					
12	Quality- related training is given to all employees in the company					
13	The creation of quality awareness among employees is ongoing in the company					
14	Training is provided for employees to improve interactive skills (such as communication skills, effective meeting skills and leadership skills)					
15	Informal benchmarking and other formal forms of information acquisition and sharing with organisations in different sectors are in place to identify best practice for improvements and opportunities					
16	Competitive benchmarking is made against primary competitors					
17	The use of SPC (statistical process control) is used to control variability and improve processes					
18	The cost of quality process to track rework, waste, rejects, and continuous improvement is prioritised					
19	The company's management always delivers the latest technology for contributing to the application of TQM and is aware of the value of updating					
20	The company's management gives great importance to research and development for the design and development of its products and services					
21	In your company emphasis on CI has been applied in all operations and at all levels					
22	There is a use of self-assessment tools and other mechanisms to track and improve performance gaps in the implementation and effectiveness of systems, processes and practices					
23	A team approach is taken (such as quality circles, cross functional teams) as the main feature for problems solving , decision making and continuous improvement					
24	The company builds its competitiveness on the basis of providing high quality services					
25	Within your company there is comprehensive identification of customers and customer needs and alignment of processes to satisfy the needs					

26	Your company uses customer surveys and feedback processes, and tracking of other key measures to assess customer satisfaction					
27	Systematic reviews and analysis of key process measures that have a direct or indirect impact on value-addition to customer satisfaction are implemented					
28	Your company supports any change in style or structure required to adapt the changes in the business environment					
29	In your company the managers trust the employees to do their work properly					
30	There is an advanced technological information system to support implementing advanced quality management system.					
31	Your company uses information systems to provide high-quality data and information to employees in order to achieve high quality					
32	The company possesses a web site which provides all the information needed by the customer about the products and services provided by the company					
33	There is a general policy development and effective deployment of goals in the company					
34	TQM principles are used in reviewing the formulation and implementation of strategy					
35	There is strategic quality planning of the long term quality journey					
36	The company conducts periodic examinations of the materials supplied to ensure conformity with the standard specifications					
37	Your company develops relationships with your suppliers that leads to continuous improvements in quality					
38	Your company depends on relatively few dependable suppliers who are evaluated and selected based on their capability and commitment to product, service quality and value for money					

Part 3:

The following part of the questionnaire describes the results of applying TQM. By answering this part, you show the results of applying TQM in your company. A response, therefore, of strongly disagree indicates that your company does not achieve good results in respect of this field. A response of strongly agree, on the other hand, indicates that you believe your company achieves good results.

Please tick (✓) in the box that best reflects your answer

1= Strongly disagree

2= Disagree

3= Neither agree nor disagree

4= Agree

5= Strongly agree

1	Business growth rate is improving in the market					
2	The averages of interest are increasing					
3	Your company is increasing its investment in order to fully utilise its capital assets					
4	An organised and encouraging environment engenders invention and creation in the company					
5	The average number of defects is decreasing in company productions					
6	The ability to achieve strategic objectives is increasing					
7	Investment return growth is high in your company					
8	The average number of customer complaints is decreasing					
9	New improved and varied products and services are increasing in your company					
10	Your company invests in modern technology to ensure parity with its competitors					
11	There is a strong growth rate of the market share for your company					
12	A growth in contract agreements between your company and other organisations in order to provide telecommunication services is evident					

Part 4:

This part includes six statements aimed to explore the role of external environmental factors in Jordanian context play in encouraging TQM implementation and sustainability

Please tick (√) in the box that best reflects your answer where:

1= Strongly disagree

2= Disagree

3= Neither agree nor disagree

4= Agree

5= Strongly agree

No	environmental factors	1	2	3	4	5
1	The government policy of imposing taxation encourages TQM implementation in companies					
2	The government procedures such as rewarding the companies that applied TQM and the individuals who are willing to apply the TQM approach					
3	Government regulations specify the minimum level of quality service which must be provided by the company to meet the customer's needs and protect their expectations					
4	The education institutions in the local community provide the companies with well educated staff who are able to provide high quality TQM implementation					
5	The local community's culture demands a continuous development of customer service quality					
6	Social culture is focused on product quality and services provided by the company more than the price					

Part 5:

Please arrange the following ten factors from the most to the least effective factor according to which degree it prevents the success of adopting a total quality management in your company {Give number (1) for the most effective factor through to number (10) for the least effective factor}

- ☐ Weakness of attention to a quality culture
- ☐ Weakness of commitment in employee empowerment and training programmes
- ☐ Weakness of commitment of top management in achieving continuous development
- ☐ Weakness of attention to the supply chain relationship
- ☐ Weakness of focusing on customer satisfaction and their expectations
- ☐ Weakness of commitment to quality strategy requirements
- ☐ Lack of top management commitment and belief in the programmes of TQM
- ☐ Lack of use of quality measurement and benchmarking
- ☐ Poor organisational communication
- ☐ Inefficient information systems used in the company

Many thanks for answering this questionnaire

Appendix B

The semi-structured Interviews Questions

Question One

To assess the adoption of the TQM factors in the Information and Communications Technology (ICT) Sector in Jordan all the interviewees were asked “Which TQM factors have been implemented in your company? (Choose from the following list).

- top management commitment;
- quality communications and structure;
- employees empowerment and training;
- quality measurement and benchmarking;
- continuous improvement;
- customer focus and satisfaction;
- policy and strategic planning,
- organisational culture;
- quality information systems;
- suppliers relationships.

Are there other factors you would like to add.....

Question Two

To explore the impact of TQM implementation on improving company competitiveness, the interviewees were asked to discuss the results of applying TQM and how it seemed to have influenced company competitiveness.

Question Three

What is the role of environmental factors in encouraging the implementation and sustainability of TQM on your company?

Question Four

What are the main impediments that hinder TQM adoption in your company?


At the end of the interviews all the participants were asked if they would like to add any additional information relating to any of the issues contained in the questions.

Appendix C

Questionnaire covering letter in Arabic

بسم الله الرحمن الرحيم

AL-HUSSEIN BIN TALAL UNIVERSITY
Office of the President



جامعة الحسين بن طلال
مكتب الرئيس

Ref. : الرقم : ٢٢٧ / ٤ / أ
Date : التاريخ : ٢٠٢٢ / ٦ / ٢٩

لمن يهمه الأمر


تحية طيبة، وبعد:

أرجو التلطف بالعلم أن الطالب نسيم محمد الطويسى موفد جامعة الحسين بن طلال لنيل درجة الدكتوراه في تخصص إدارة الجودة في جامعة هدرزفيلد / بريطانيا، يرجى الموافقة له على توزيع استبانته وإجراء مقابلات مع المديرين والعاملين في قطاع الاتصالات وتكنولوجيا المعلومات؛ استكمالاً لمتطلبات البحث المنصوص له لدراسة الدكتوراه بعنوان " استكشاف واقع تطبيق إدارة الجودة الشاملة في قطاع الاتصالات وتكنولوجيا المعلومات في الأردن ".

فأعدو ممتناً بالموافقة على مساعدة الطالب المذكور في استكمال إجراءات بحثه.

وتفضلوا بقبول وافر الاحترام،،،

/ رئيس الجامعة



الدكتور راتب العوران

Visit the University site on the web at: <http://www.ahu.edu.jo>
Our e-mail address is: president@ahu.edu.jo

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Appendix D

Key factors on TQM success factors

Table 6.5 Employee empowerment and training

No	Statement	Mean	STD.DeV
1	In your company most employees' suggestions are implemented	3.55	0.84
2	Employees are encouraged to accept responsibility for quality	3.80	0.96
3	There is a system for recognition and appreciation of quality efforts and success of individuals and teams	3.83	0.90
4	There is a system that links reward to employees' quality achievement	3.91	0.90
5	Quality- related training is given to all employees in the company	3.83	0.82
6	Training is provided for employees to improve interactive skills (such as communication skills, effective meeting skills, and leadership skills	3.89	0.89
	EET	3.80	0.62

Source: Data analysis result

Table 6.6 Quality measurement and benchmarking

No	Statement	Mean	STD.DeV
1	Informal benchmarking and other formal forms of information acquisition and sharing with organisations in different sectors are in place to identify best practices for improvements and opportunities	3.57	.85
2	Competitive benchmarking is made against primary competitors	3.86	.74
3	The use of SPC (statistical process control) is used to control variability and improve processes	4.51	.58
4	Cost of quality process to track rework, waste, rejects and for continuous improvement is prioritised	3.66	.74
5	There is a use of self – assessment tools and other mechanisms to track and improve performance gaps in the implementation and effectiveness of system, process and practices	3.01	.68
	QMB	3.72	.46

Source: Data analysis result

Table 6.7 Continuous improvement

No	Statement	Mean	STD.Dev
1	The company's management always delivers the latest technology for contributing to the application of TQM and aware to the value of the Updating	3.70	1.00
2	The company's management gives great importance to research and development for the design and development of its products and services	3.75	.90
3	In your company emphasis on continuous improvement has been applied in all operations and at all levels	3.66	.98
4	A team approach is taken (such as quality circles, cross functional teams) as main feature to solve problems, decision making	3.84	.82
5	The company build its competitiveness on the basis of providing high quality services	3.73	.76
	CI	3.74	.65

Source: Data analysis result

Table 6.8 Customer satisfaction

No	Statement	Mean	STD.Dev
1	Within your company there is comprehensive identification of customers and customer needs and alignment of process to satisfy the needs	3.91	.60
2	Your company uses customer surveys and feedback processes, and tracking of other key measures to assess customer satisfaction	4.16	.60
3	Systematic review and analysis of key process measures that have a direct or indirect impact on value – addition to customer satisfaction are implemented	3.40	.59
	CS	3.81	.48

Source: Data analysis result

Table 6.9 Organisational culture

No	Statement	Mean	STD.DeV
1	Your company supports any change in culture or structure required to adapt the changes in the business environment	3.72	.58
2	In your company the managers trust the employees to do their work properly	3.73	.63
3	The creation of quality awareness among employees is ongoing in the company	3.74	.59
	OC	3.73	.49

Source: Data analysis result

Table 6.10 Quality information systems

No	statement	Mean	STD.DeV
1	There is an advanced technological information system to support implementing advanced quality management system	3.65	.68
2	your company uses the information systems to provide high-quality data and information to employees in order to achieve high quality customer services	4.19	.67
3	The company possesses a web site provides all the information needed by the customer about the products and services provided by the company	3.81	.
	QIS	3.88	.62

Source: Data analysis result

Table 6.11 Policy and strategy planning

No	Statement	Mean	STD.DeV
1	There is a general policy development and effective deployment of goals in the company	4.22	.82
2	TQM principles are used in reviewing the formulation and implementation of strategy	3.98	.88
3	There is strategic quality planning of the long term quality journey	3.83	.83
	PSA	4.00	.65

Source: Data analysis result

Table 6.12 Supplier's relationships

No	Statement	Mean	STD.DeV
1	Your company develops relationships with your suppliers that lead to continuous improvements in quality	4.06	.79
2	Your company depends on relatively few dependable suppliers who are evaluated & selected based on their capability and commitment to product, service quality and value for money	3.99	.75
3	The company conducts periodic examinations of the materials supplied to ensure conformity with the standard specifications	3.85	.79
	SR	3.96	.61

Source: Data analysis result

Appendix E

Mapping of High Level Research Questions to Data Capture Questioning

Objective One: To assess the adoption of the TQM factors in the Information and Communications Technology (ICT) sector in Jordan

Questionnaire Question No	Research Issues	Semi-Structured Interview	Combined Analysis of Questionnaire and Interview Results
	Issue Explored	Topic No	General Conclusions
1	Top management commitment	1	Strong indication of senior management commitment
2			
3			
4	Quality communication and structure	1	Strong indication of quality communication and structure
5			
6			
7			
8	Employee empowerment and training	1	Employee empowerment is weak training is strong
9			
10			
11			
12			
14			
15	Quality measurement and benchmarking	1	Strong quality measurement and benchmarking
16			
17			
18			
22			
19	Continuous improvement	1	Weak continuous improvement
10			
21			
23			
24			
25	Customer focus	1	Strong customer focus
26			
27			
13	Organisational culture	1	Weak organisational culture
28			
29			
30	Quality information system	1	Strong quality information system
31			
32			
33	Policy and strategic planning	1	Strong policy and strategic planning
34			
35			
36	Supplier relationships	1	Strong supplier relationships
37			
38			

Objective two: To explore the impact of TQM implementation on improving companies' competitiveness through profitability, service quality, effectiveness and market share.

Questionnaire Question No	Research Issues	Semi-Structured Interview	Combined Analysis of Questionnaire and Interview Results
	Issue Explored	Topic No	General Conclusions
1	Market share	2	Positive effect
11			
12			
2	Profitability	2	Positive effect
3			
7			
8	Service quality	2	Positive effect
9			
5			
4	Effectiveness	2	Positive effect
6			
10			

Object three: To explore the role of environmental factors (government policy and social culture) in encouraging the implementation and sustainability of TQM in the Jordanian ICT sector

Questionnaire Question No	Research Issues	Semi-Structured Interview	Combined Analysis of Questionnaire and Interview Results
	Issue Explored	Topic No	General Conclusions
1	Government role	3	Government rewarding policy has encouraging role Government policy taxation, policy of new licences and government bureaucracy have discouraging role
2			
3			
4	Social culture role	3	Education system has encouraging role Customer perspective has discouraging role
5			
6			

Objective four

To identify the main impediments to the adoption of TQM in the ICT sector in Jordan. The respondents were asked to rank the following ten TQM factors from the most important to the least important according to the degree they hinder successful TQM implementation. In addition they were asked in the interviews “what are the main impediments that hinder TQM adoption in their companies?”

Questionnaire Question No	Research Issues	Semi-Structured Interview	Combined Analysis of Questionnaire and Interview Results
	Issue Explored TQM implementation impediments	Topic No	General Conclusions
1	Weakness of attention to quality culture	4	<div>1. Organisation culture</div> <div>2. Employee empowerment</div> <div>3. Continuous improvement</div> <div>4. Government policy of giving new license</div> <div>5. Government taxation policy</div> <div>6. Government bureaucracy</div>
2	Weakness of commitment in employee empowerment and training programme		
3	Weakness of commitment of management in achieving continuous development		
4	Weakness of attention to the supply chain relationship		
5	Weakness of focusing on customer satisfaction and their expectations		
6	Weakness of commitment to quality strategy requirements		
7	Lack of top management commitment and the programme of TQM		
8	Lack of use of quality measurement and benchmarking		
9	Poor organisational communication		
10	Inefficient information system used in company		